

# Audubon

MARCH APRIL 1958

Magazine

FIFTY CENTS

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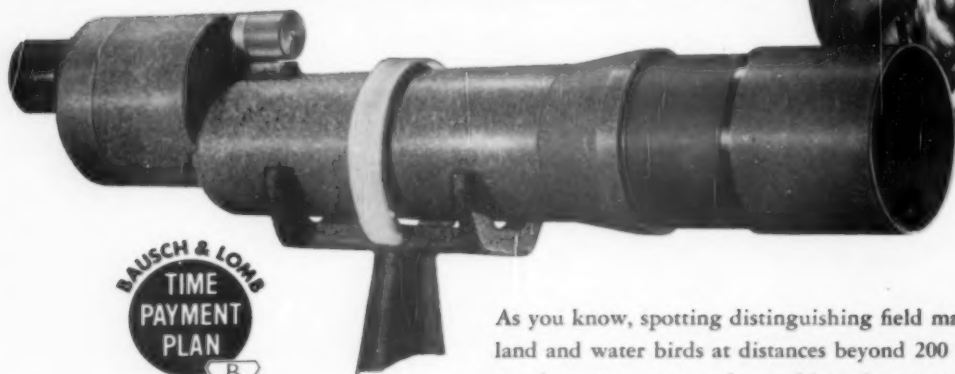


SPRING CLIMBS A MOUNTAIN page 60



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Volume 60, Number 2, Formerly BIRD-LORE

PUBLISHED BY THE NATIONAL AUDUBON SOCIETY

A bimonthly devoted to the conservation of wildlife, plants, soil, and water

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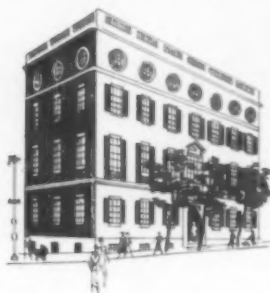
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## Letters

### Against Aerial Spraying of Chemicals

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Flesh taken from people operated upon shows traces of deadly and poisonous DDT, etc.

J. RICHARD FEELEY

Amesbury Mass.

### Jack-Rabbit Chases Hawk

The following incident occurred while Mrs. Page and I were on a very rewarding birding vacation based on Pettingill's, "A Guide to Bird Finding West of the Mississippi." We were each equipped with 8x30 binoculars, so that the details of the incident were clearly seen.

In early June driving from Ogallala, Nebraska toward Colorado, Mrs. Page and I paused beside the highway to watch a marsh hawk coursing low over the prairie in search of prey. It sighted something and fell on it in the short grass. It remained on the ground a minute or two, then we were astounded to see a jack-rabbit come bounding over the prairie toward the hawk. I thought the creature was scared out of its wits, and was running the wrong way—but not at all. The jack-rabbit, losing sight of the hawk while traversing a dip in the prairie, stopped at the top of the following rise, sat up, again caught sight of the hawk on the ground and plunged toward it at full speed. The marsh hawk managed to rise and gain an altitude of two or three feet before the jack-rabbit arrived. Being heavily laden with its prey, a baby jack-rabbit, the hawk could neither fly rapidly nor gain altitude rapidly, and the adult jack-rabbit ran along just under the marsh hawk—daring it to come down, within "kicking reach."

We thought we had seen everything—a jack-rabbit chasing a hawk—but we hadn't. By the time the marsh hawk had gained an altitude of about 60 to 80 feet, a Swainson's hawk arrived and dived on the marsh hawk. After a short swirling pursuit, watched by the jack-rabbit, the marsh hawk dropped its prey and the adult jack-rabbit loped over to the body of the young rabbit and stood over it. The Swainson's hawk drove the marsh hawk away then re-

turned and circled overhead for five minutes—apparently waiting for the adult jack-rabbit to go away, so that the Swainson's hawk could recover its highjacked booty. After five minutes of circling at an altitude of about 90 or 100 feet the Swainson's hawk drifted away and out of sight. It did not make any attack upon the adult jack-rabbit.

I assume that the taking of baby jack-rabbits by hawks is normal. But is the rest of the incident we witnessed normal? Or did we run across a demented jack-rabbit?

Washington, D. C. HENRY N. PAGE

#### COMMENT

Hares, or jack-rabbits, and even the smaller cottontail rabbits have been known to defend their young ones against predatory animals that were attempting to kill them. A captive hare fought off a weasel that was trying to get at her young, and cottontail rabbits have been known to defend their litters against blacksnakes which eat young cottontails when they can get them. Al-

#### LETTERS

Owing to the limitations of space in the letters column of *Audubon Magazine*, please try to keep your contributions to 400-500 words or less. — The Editor

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though Mr. Page's account of a jack-rabbit defending its young against a hawk is unusual, we do not believe that the animal was demented. Its behavior was probably normal, in that it was trying to protect its young one, just as others of its kind have done. Whether its motive was prompted by "instinct" or emotional attachment, is a matter we shall leave for our readers to decide.

—The Editor

### Brown Thrasher Kills Mouse

On the ground outside the window my husband saw a brown thrasher attacking a mouse. He drew my attention to the onslaught and we watched for probably five minutes while the thrasher put an end to his victim. It was relentless in the attack which was one-sided and in its favor. Just how long the attack had been going on before it drew our attention, I don't know, but the mouse was still moving and trying to get away. The thrasher pulled itself upright, head back, and pounded the mouse on the head with its beak until it was dead.

MRS. KATHRYN BARNER

Easton, Maryland

### Bluebirds in the Bermudas

In Dr. Pettingill's informative article on bird finding in the Bermudas in the September-October issue of *Audubon Magazine*, he says (p. 225) that bluebirds were "far more numerous than I had ever found them on the continent. In the past [in the Bermudas] there were times when bluebirds were so abundant that some pairs had to nest in the open, owing to lack of suitable sites." This statement is based on an article, "Breeding Birds in Bermuda," in *The Ibis* for January 1957, by W. R. P. Bourne, who writes (p. 101):

"In the period when it was unusually abundant the bluebird forsook its hole-nesting habit and built in the open (Reid 1884)." Bourne makes the additional comment (p. 103) that the bluebird is now "Common around houses, in gardens, around farms, and in all open spaces. . . . The nest and eggs are now typical for the species, although according to Reid it formerly nested in the open and laid white eggs."

What Captain Savile G. Reid actually said in *Birds of Bermuda*, Bulletin 25, U. S. National Museum (1884), was that the bluebird was "very common. . . . Eggs, four or five, delicate pale blue, unspotted. . . . Nest of grasses . . . in all manner of places." Of the 11 varieties of sites he enumerated, nine were in some sort of cavity, and only two could be interpreted as "in the open." These were "on the branches of trees" and in the nests of cardinals. Both Bent (1949) and Roberts (1932, "Birds of Minnesota") mention some-

what similar sites as occasionally utilized as nest sites by bluebirds in North America. My husband recalls finding in boyhood a number of bluebird nests built in hollow posts and open to the sky.

Whether bluebirds were actually more abundant in the Bermudas in 1884 than now would seem impossible to determine. At any rate at that time in Bermuda they had the cavities all to themselves, whereas now Dr. Bourne, (p. 104, *The Ibis*, January 1957 issue) tells us the house sparrow in Bermuda is "exceedingly abundant everywhere, large numbers breeding in the remotest cliffs and quarries"—some of the very sites listed by Captain Reid as favored by the bluebirds.

Through careless reading of source material Dr. Bourne jumped to a conclusion, with wide biological implications, for which there appears to be no evidence. We do not need to postulate an enormous population of bluebirds in the past that was forced to forsake its ancestral habits due to a most improbable shortage of cavities.

MARGARET M. NICE

Chicago, Illinois

### Another Florida "Eagle Tree" to Go


A recent account in a Florida newspaper told my husband and me that a Florida bald eagle's nest in Oldsmar must be cut down to make room for a new defense plant. The pair of eagles there have weathered much construction in the neighborhood, and even the coming and going of people and machinery working on the farm which adjoins the tree holding the big structure.

The nest has been in this huge old pine for many years. My husband, the eagle bander, C. L. Broley, put leg-bands on a pair of youngsters there in 1939—the first season that he banded. He has banded young eagles in this nest most years since. The tree is getting old and insecure, therefore it might not serve the eagles much longer anyway. One thing that is notable about this nest—Mr. Broley has never had a "return" from any of the 17 eaglets banded in it. Presumably none of these eagles were ever killed. This is exceptional because,

Turn to page 34

### CORRECTION

John V. Dennis, author of the three-part article, "Are Warblers Decreasing?" has called our attention to a typographical error in Part II of his article, published in the November-December 1957 issue of *Audubon Magazine*. On page 281, opposite "hooded warbler," instead of 97, the numbers of this bird recorded at Nantucket in 1953 was only 7.—THE EDITOR



The charming lady who took this beautiful photograph with her Questar in January 1958, did so from her living room, 37 feet from a dining room window. The bird was outside, only 3 feet beyond the glass. Its nearness to the window pane perhaps explains why so little of the usual distortion from window glass is evident.

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A nest, only about three miles away from the Oldsmar eyrie had a tragic history. In 1939 Mr. Broley banded two young in it, and both were shot—one in Georgia, the other in Virginia. In 1940, the one young bird tagged there was reported shot in North Carolina. The next year the band attached to the leg of the young bird was returned from Prince Edward Island, and in 1948 a return came from Medford, Massachusetts. This nest is in a secluded area into which few people ever penetrate, yet these eaglets had not learned to be wary of men.

It is sad to see these big "eagle" trees and the fine nests they support cut down, but progress is necessary. Perhaps the pair of eagles occupying the nest in Oldsmar will move to the nearby cypress swamps where they will be able to nest safely once more. We hope so.

Tampa, Florida

**Comment**

We refer our readers to the article, "*The Plight of the Florida Bald Eagle*," by Charles L. Broley, *Audubon Magazine*, January-February 1950, and to our discussion of Mr. Broley and his eagle-banding reported in the "*About the Authors*" column, p. 68 of that issue. See also Mr. Broley's subsequent reports in the "*Letters*" column of *Audubon Magazine*, May-June 1950, March-April 1951.

### Conservation in Florida

I guess you know the Key Deer Bill was passed and signed by President "Ike" just before Congress closed. After all these years it has finally come true. If so many wonderful members of the National Audubon Society hadn't worked so hard to support the bill I don't think it would have passed this time. I'm glad to see conservation of all natural resources is finally getting public interest and attention.

A couple of years ago I wrote to Governor Collins about pupils studying conservation in elementary grades and reciting the conservation pledge. He was interested in my suggestion and sent it to State Superintendent of Education, Mr. Bailey. He also wrote me and said he liked my idea and would bring it up at a State Teachers' meeting.

Conservation is so important to everybody. I remember in New York City when they had a water shortage and even a dripping faucet was bad. Before Key West got the water-line from Homestead a few years ago the ONLY water they had was what they saved whenever it rained. It is the same with the trees, that's why the Florida slogan is "Keep Florida Green." The Tropical Audubon Society has started a youth conservation club with the public library, and it's catching on. It all makes for a good start.

GLEN T. ALLEN

**Miami, Florida**

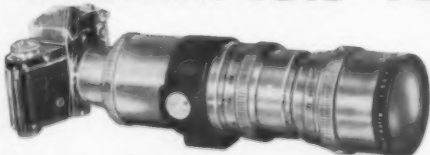
**COMMENT**

Many of our readers will remember 16-year-old (now 18-year-old) Glen T. Allen, an Eagle Scout of Miami, Florida, an account of whom we published in "*Nature in the News*," *Audubon Magazine*, p. 227, September-October 1956 issue. Glen has worked hard to arouse public interest in establishing a permanent refuge for the Key deer, and we are proud of the enthusiasm and energy of this young conservationist, who remains one of our faithful correspondents.—The Editor

### A Satisfactory Chickadee Feeder

We have found one of the most satisfactory feeding arrangements for chickadees and nuthatches is the coconut wren house, as pictured on page six of the January-February 1958 issue of *Audubon Magazine*. The long bill of the nuthatch reaches inside for sunflower seeds and peanuts and the chickadees pop right in themselves and "browse." The larger

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birds have other receptacles for provender; the little fellows can feed unmolested as the hole is too small for larger birds to enter the feeder. (A gray squirrel tried to reef in the chain from which the house-feeder is suspended, but only succeeded in dislodging a few seeds. We keep the coconut filled almost to the entrance hole.) It's great fun to watch the little black chickadee head poking out, and in, for more food.

MRS. VIRGINIA MORRISON  
Pleasantville, New York

#### Our Need to Dignify Bird Study

When bird study first opened its wonders to me in 1936, I do not recall that the practitioners of it were normally referred to as other than bird students, bird observers, or ornithologists. In recent years, however, a very regretful description is becoming a fixture in the public mind and press. I refer to the term "bird watcher" which I believe has damaged the prestige of bird study and the dignity of those who follow it.

It seems that it is now almost impossible to read or hear anything about ornithology or ornithologists except that the subject is "bird watching" and the participants, "bird watchers"—words that have been so generally used, and over-used, that ornithologists have become the victims of lazy, indifferent, or facetious grades of reporting and writing; and one of the favorite goats of the joke makers.

Here are some examples of dozens I could mention:

1. Fibber McGee and Molly did a radio stint recently on Radio Central. McGee had taken up bird watching in a theme calculated to make birding appear stupid and idiotic. Of course, this gave nature "know-nothings" something to laugh at.

2. *The New York Times*, August 5, 1957, published a photograph of Dr. Herbert Friedmann, curator of birds, Smithsonian Institution, and said Dr. Friedmann was a renowned authority on African birds, and a writer of limbericks illustrating the museum's exhibition. Can you imagine what title they used for the picture of this eminent scientist? *Bird watcher!*

In my opinion, using "bird watcher" to describe a bird naturalist, either professional or amateur avocation, ranks with "clock watcher" in its lack of definition and its hint of sarcasm. Bird watching might do for the most superficial of yard and garden observing, but it definitely does nothing to describe or enhance the active, learned types of bird study. I would not be critical without offering a few words of remedy: For the serious students of the science, I think we should say bird scientist, bird artist, bird photographer, bird ex-

pert, ornithologist, etc., according to the type of work involved.

For those of us who are not so expert or professional—but who nevertheless put mental and physical effort into the subject—there can hardly be a more satisfying description than *bird specialist*, although I believe I could write a hundred definitions of birdmanship and never once use "bird watcher" or its equally insidious twin, "bird lover"—for example, bird naturalist, bird student, bird patron, field observer, bird spotter, field naturalist, bird researcher, bird hobbyist, bird hiker, bird scholar, birdlorist, and many more.

The point is this: descriptions that indicate intellectual and muscular activity will sound flat and unwieldy from the mouths of self-assumed funnymen; and such dignified names tend to build up the stature of bird work in all of its many departments.

But now that the birder and his glass have become etched in the public's mind as something of "an odd-ball" who likes to "watch robins, pigeons, and starlings"—brought on, I'm certain, by careless and ceaseless use of bird watching and bird watchers as exclusive words of description—I pray that our nature publications will lead us out of this situation by using and advocating a nomenclature that will accurately portray the topic of birdlife, and the specialists who devote themselves to it.

If this is not done, if bird people themselves do not dignify themselves with the right kind of words of definition, it will be years before the general

*Continued on page 58*

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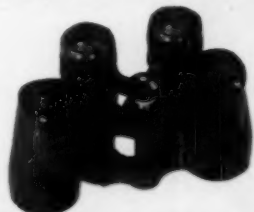
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## Roger Peterson's

### Andean Condors

THREE days with three dead dogs—and nothing to show for it. This time my vulture vigil was for condors—Andean condors.

During my recent expedition to western Bolivia and northern Chile I looked for this largest of all soaring birds and in nearly a month of field work saw but one in the high cordillera. On the coast, however, I observed several in an afternoon's walk along the sea-cliffs, so I decided that rather than try to photograph these fabled birds in the mountains I would try for them by the sea (apparently they are absent from the 200-mile wide belt of dead desert between the Andes and the sea—there is nothing there for these scavengers to eat).

The coastal city of Antofagasta lies in a rainless region, devoid of vegetation, even grass, so my companion, Luis Peña of Santiago and I soon discovered that animals such as goats were non-existent. However, there were burros. How they survive we don't know. Several near the municipal dump were feeding on garbage and paper. Inquiries at the dump produced no dead burros, but we did locate three mongrel dogs, recently deceased. Two were red, one was gray. Gingerly lifting them by their tails we placed them in the back of our Dodge power-wagon for the 30-mile haul to the spot where we knew condors would pass. The sun sank into a magnificent splash of color over the Pacific as we arrived at our encampment and we deemed it best to bury the dogs in a shallow trench to foil the night-foraging foxes. We dug the pit 30 feet from the truck and at least 50 feet from my sleeping bag, but apparently every flea harbored by these three dogs found me before morning and I am still scratching the miserable bites they inflicted on my exposed arms.

Picking a site for the blind was done carefully—an open spot with a photogenic cluster of rocks on which the condors might sit, and another pile of rocks on a slope 100 feet away where we constructed a natural blind. There were many

loose granite rocks at our disposal and these we stacked into a circular wall, enclosing the top with a piece of canvas weighted down at the edges by sand and stone. Just before we put the finishing touches on this small fortress three turkey vultures soared lazily past and then, heading directly for us, sailed a condor, a juvenile. It passed over at less than 100 feet, circled back to look us over more carefully, and moved on. This was bad. We had not yet put out the dogs, but we had not wanted the birds to see us at work.

It was late in the morning before I got into the blind where I stayed until my companion relieved me at 6:00 p.m. The turkey vultures had arrived within 20 minutes but they were cautious and sat all afternoon at a distance of a hundred yards. Once in a while a vulture soared over the now fetid dogs and I saw its dark shadow cross the canvas that separated me from the sun. But no condors. The wind by now had freshened while the air in my crowded quarters was not so fresh. The breeze blew directly up the slope from the carcasses to my hide-out.

Through the numerous chinks in my rocky cell, I could see the ocean to my right. Once I caught sight of a great flock of guanay cormorants, a long black river of birds, an endless ribbon beating low over the waves. I wondered whether vultures have such keen eyes that they could see through the small holes of a blind such as mine. Spreading my focusing cloths and my heavy jacket against the walls to eliminate this hazard, I fastened them in place with small stones.

I was willing to spend three days if necessary to get my pictures—and three days I stayed. On the second morning the turkey vultures came within six feet of the bait and I got several portraits—but after all, I could have accomplished as much in New Jersey. It was not until the morning of the third day that a vulture touched the carrion. Three birds were so bold as to start to feed and immediately vultures poured in from all directions. From my peep hole I counted 50 seated on the

## BIRD'S-EYE VIEW

sand. Then as suddenly as this activity had built up it subsided. A wave of fear seemed to come over the mob. Withdrawing to a distance of 50 yards or more they just sat and waited. It must have been about this time that the two condors flew over. I did not see them but Luis Peña reported that they circled overhead two or three times and then continued down the coast.

A fourth day might have produced results, but I had to return to catch my plane. I don't really know whether more days would have turned the trick. I recalled that John Pemberton put out 30 carcasses before he succeeded in getting photographs of California condors.

My own experience with vultures has shown them to be very capricious. Are they naturally wary; do they see the photographer through the holes in the blind? Or does the carrion have to be at precisely the right state of decomposition? Or, if vultures have recently fed, are they no longer interested? Once, at Bear Mountain in New York State, I hauled the carcass of a car-killed deer to an open slope, put up my burlap blind and camouflaged it with wild grape vines. For two long days I stewed in my own sweat while the carcass, 30 feet away, ripened, and flies swarmed. The vultures, at a discreet distance, sat hunched in a tall dead hemlock like undertakers waiting to officiate at a burial. On the third day I dismantled my blind. Less than three hours later a friend chanced by; as he approached, a cloud of vultures flew up. All that

remained of the deer were a few scattered bones. Had they detected my presence?

On another occasion, trying for griffon vultures in Spain, Guy Mountfort and I waited an entire day in two expertly concealed blinds. We placed the body of a deer in an open place at the foot of a gnarled dead cork oak. It was a perfect setting—one that Gustav Doré would have chosen for vultures. But not even a kite came to investigate. The Spanish horsemen and *guardas* who had helped us construct the hides seemed disappointed in the *Ingles* and the eccentric *Americano* when we returned to the *coto* at sundown and reported our lack of success. Four years later, near the same

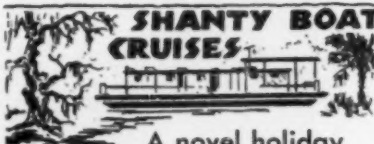
*Continued on page 96*



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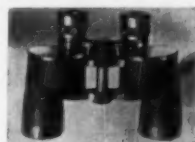
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run of writers and speakers ever think of using anything else but "bird watching" and "bird watchers" to describe people who practice the art and science of birdlore.

LEIGHMAN HAWKINS  
Roanoke, Virginia

#### COMMENT

We will appreciate having the opinion of some of our readers about this. Perhaps all of us may not agree with Mr. Hawkins' view of how the public feels about a bird-watcher, but we think his charges against the misuse by the press of the term are borne out, although with varied frequency.

People who pursue certain of the natural sciences have always, in this country, been subjected to some form of ridicule by the public. However, ridicule often changes to respect, if not admiration when people in general learn the fun and the intellectually stimulating values of "bird-watching," or any other of the natural sciences.

Mr. Hawkins' letter may be a challenge to each local bird club or nature club (which hasn't gotten a sympathetic local press), to show that bird-watching, "chasing butterflies," or any other nature activity has just as much value to our personal development and happiness as we can get from tennis, golf, swimming, or any other outdoor sport. Some of us may be old enough to remember when golf and tennis in this country were "sissy" games, and followed only by people thought to be eccentrics. Both of these games are in good standing today, just as bird-watching is now accepted in many parts of our country as an interesting and increasingly respected hobby.—The Editor

#### Enjoyed our Christmas 1957 Issue

The November-December issue of *Audubon Magazine* brought me even more reading pleasure than usual and this despite the fact that as a general rule I read it from one cover to the other. . . . The fact that I was born and grew up on the Canadian shore of a Minnesota border lake rather warmed me to Mrs. Hoover's charming and convincing argument that "Weasels are Wonderful!"

Mr. Clark's "Adventures for Bird-watchers in Jamaica" recalled very happily a brief holiday among the birds of that island, particularly about Kingston and in the Blue Mountains.

Thank you for the pleasure *Audubon Magazine* brings to me and to those to whom I pass it on, and every good wish for the Society's continued success.

M. H. MALTBY  
Toronto, Ontario, Canada

## Carl W. Buchheister to succeed John H. Baker as President of The National Audubon Society



Photograph by Dorothy Dingley

*Dr. Paul B. Sears, Chairman of the Board of Directors, at the annual dinner of the 53rd Convention of the National Audubon Society, in New York City on Tuesday, November 12, 1957, read the following announcement:*

"THE Committee appointed by the Board of Directors to consider a successor to John H. Baker upon his retirement gave the matter most careful consideration, both individually and in consultation with other members of the committee. It is our unanimous feeling, in the first place, that John Baker will be a very hard man to replace. However, the committee feels, without reservation, that Carl W. Buchheister has not only had experience with the National Audubon Society extending over a long period of years, but also has the character and ability to qualify him to head the Society's administration. We feel

that Carl Buchheister's standing with the members of the Society throughout the country is second to none, and that he has demonstrated at the camp in Maine, and elsewhere, his ability to share responsibilities with others, and to build up a loyal and effective organization.

"It is our feeling that Carl Buchheister and John Baker, working as a team during the next two years, will give the Society ideal leadership, and that when John Baker's time of retirement comes, Carl Buchheister will be completely conversant with the many and varied activities and responsibilities of the Society as they have developed to

the present time, and will be able to deal with them fully. We would hope that, if the Board so wishes, John Baker might be willing, after retirement, to continue to promote the Society's interests by accepting special project assignments.

"We therefore recommend to the Board of Directors that it now designate Carl W. Buchheister as successor to John H. Baker as administrative officer and President, as of the latter's retirement in accordance with the existing retirement income plan of the Society; also that the Board, in the best interests of the Society, then promptly announce its decision to the Society's membership."

Paul B. Sears, Chairman  
Guy Emerson  
Wheeler McMillen  
R. Gordon Wasson  
Charles G. Woodbury

Committee on Succession

**EDITOR'S NOTE** — In 1936, Carl W. Buchheister came with the National Audubon Society as the Director of the Audubon Camp of Maine. While serving as director there, he became the Executive Director of the Massachusetts Audubon Society, from which he transferred to the National Audubon Society in 1939. He was Assistant Director to John H. Baker, until 1944, when Mr. Baker became President, and Mr. Buchheister became Vice President of the Society.

Mr. Buchheister has now worked with the National Audubon Society for more than 20 years. During that time he has been associated closely with Mr. Baker in much of the administrative work of the Society. He has also been largely responsible for personnel management at Audubon House in New York City; the Society's relationships with Audubon Branches and Affiliates; and the establishment of Audubon Camps, their policies, and management. His warmth, sincerity, and dedicated zeal to the principles and objectives of the National Audubon Society have won him innumerable friends, many of whom got to know him at the Audubon Camps of Maine, Wisconsin, and Connecticut.

He has been the Director of the Audubon Camp of Maine for 21 years — since it began in 1936 — an outstanding service which proved his ability to administer efficiently,

to choose his staff wisely, and to instill loyalty, enthusiasm, and an eagerness to serve in those working with him, and for him.

For five years, during a part of each year, Mr. Buchheister toured the United States as an Audubon Screen Tour lecturer for the primary purpose, as he has recently said, "to seize the opportunity offered to visit the Branches and Affiliates of the National Audubon Society and to strengthen our good relations with these groups."

With the exception of John H. Baker, Mr. Buchheister is better known to more Audubon people in the United States than any other member of the staff of the New York City office. He is particularly proud to tell us that he is a native of Maryland and that his boyhood experiences with the natural history of his beloved state helped to prepare him for his career as an educator and administrator in conservation, to which his life has been, and is, devoted.

It is expected that Mr. Buchheister will succeed Mr. Baker in his duties sometime in 1959, when Mr. Baker's retirement becomes effective.

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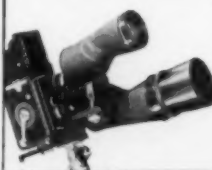
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# Spring

## CLIMBS A MOUNTAIN

Following spring up a Sierran mountain can be a beautiful lesson in the effect of altitude on the flowering of plants.

By Vera R. Johnston

HAVE you ever dreamed of following spring up California's Sierra Nevada? Of climbing from sea level to 7,500 feet in a few hours, in the greenest season of the year? In fact or fancy, late May is an ideal time to make the trip. You'll be glad to leave behind the hints of summer heat in the San Joaquin Valley, and to drive rapidly through its green and gold, rice and barley fields, past redwings swaying on roadside cattails, past neat vineyards, toward those snowy mountains to the east.

Out of the flat, fertile cherry and walnut orchards, where rosy-headed linnets nest, into the open grassy, rolling range-country of the lower foothills you climb, to 300 feet elevation. Here you remember early May, when these slopes ran pink with myriads of dainty noddling mallows, the deep blue places where slender larkspurs fought the wind, and the whiteness of a mantle of meadowfoam.

The road winds upward steadily, entering the zone of lacy digger pines at around 500 feet above sea level. The next 1,500 feet in altitude, and 40 miles in distance, bring an eyeful of foothill country—the biologist's Upper Sonoran Life Zone—and the boom area of the gold-rush days. This is a land where rolling, wooded hills, some gentle, some precipitous, alternate with ravines, creeks, thick-

ets, and with brushy arid bush cover called chaparral. The thinly-foliaged, silvery digger pines stand alone as the only conifer, looking down on wide-spreading dark-green live oaks and the bluish foliage of the smaller deciduous blue oaks. The first two weeks in May, yellow monkey flowers once turned the creeks of the Forty-Niners into gold—curving yellow ribbons through these gray-green hills.

With the passing of time, after the gold-miner's disappearance from this land came a splurge of shrub dominance and early summer herbs. Poison oak now abounds in full luxuriance, entwining trees and fences with its red and green "leaves-in-threes." California buckeye, first to leaf out in early spring, blooms with white candles, and the tall blue elderberry now sports flat-topped clusters of greenish-white flowers. Over all the south-facing, chaparral slopes, chamise gives a topping of creamy frosting to its forest-green foliage. Among the grasses wave the yellow-blotched cups of Mariposa tulips, the flower the Spaniards named "butterfly." Medicine is here, if needed, in the form of yerba santa, a three-foot shrub whose shiny aromatic leaves were so valued for respiratory infections by the early Spanish fathers that they named it "holy plant." Its violet blossoms attract many an insect, for example, the red admiral butterfly.

Upper Sonoran birds vary little from elevations of 100 to 2,500 feet as you climb the Sierra, and they are all nesting during May. Bewick's



"Among the grasses toss the cups of Mariposa tulips."

Photographs by the author

"Yerba Santa, named by the early Spaniards in California, the 'holy plant.'"



← "Into the open, grassy rolling country of the lower foothills."

wren bubbles its metallic song from the blue oaks, and an acorn woodpecker hitches into her nesting hole in a telephone pole. Nearby fence posts are potted with holes which it has chiseled, and in some of which it has wedged acorns so tightly as to be almost non-removable. Lark sparrows intersperse their melodic tunes with buzzes and burrs. A black phoebe flips under a bridge with caterpillars wriggling in its bill. In

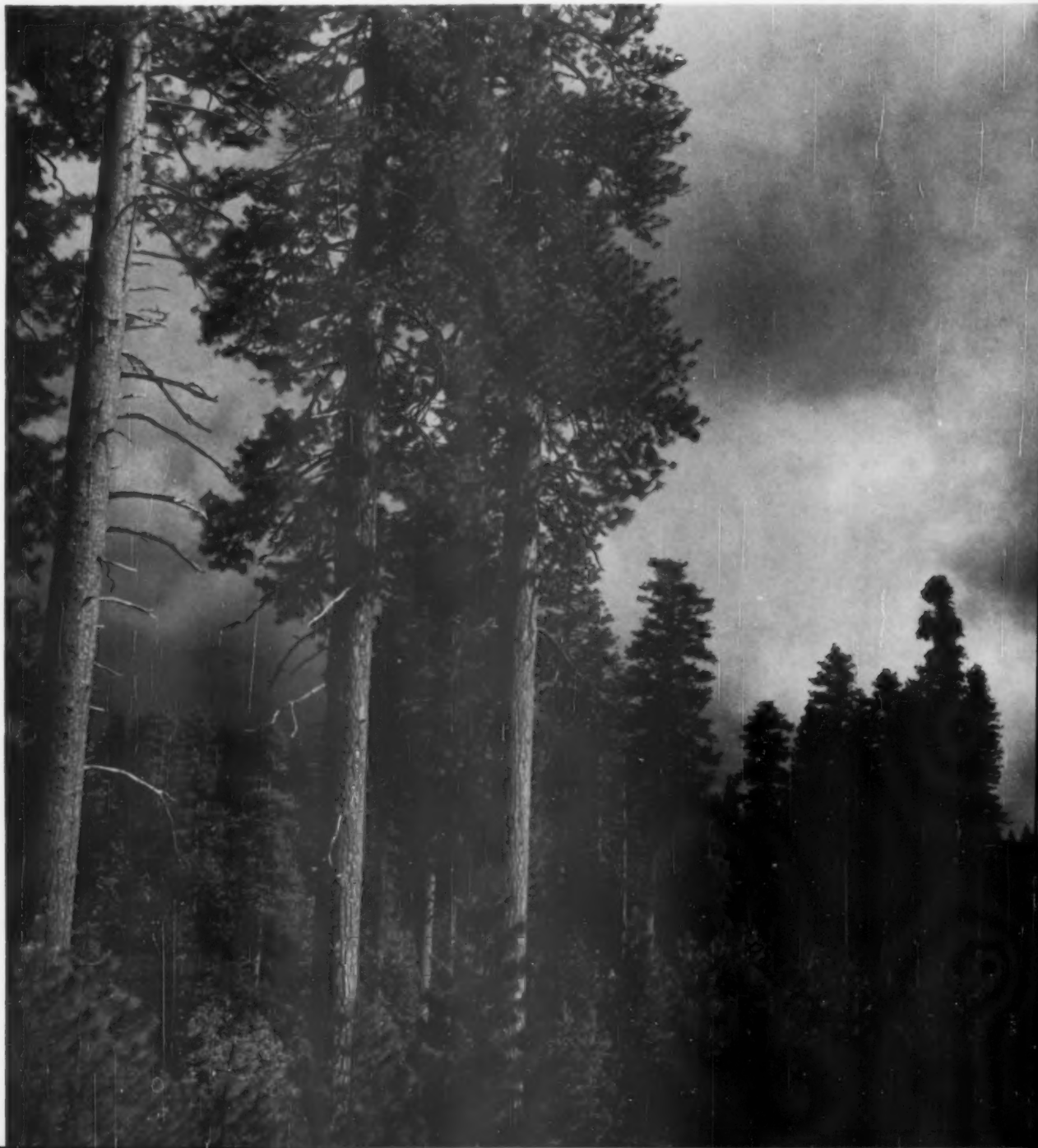
the clear blue overhead, turkey vultures spread black and silver wings and glide with the air currents. Cow bells tinkle in the still green meadows. And everywhere vistas lead to more and distant hazy mountains—peaked by mushrooming cloud cumuli.

You know you're getting closer to the mountain's heart when the first ponderosa pines loom into view—for their friendly profiles dominate

the largest belt on the western Sierra Nevada slopes—the magnificent open forests of the Transition Life Zone. In the central Sierra, this zone covers elevation from 2,500 to 6,000 feet, and includes among its flora and fauna more varieties of birds, trees, and flowers than any of the other zonal regions.

The trees catch your eye first, as a markedly dark green contrast to the silvery gray-green tones of foot-

**"The magnificent open forests of the Transition Life Zone."**





"A scattering of the white flowers of mountain misery on the forest floor."



→ "The cascading sprays of deerbrush burst out anew each spring."

"Meadows of the lower Transition Zone have an early bloom of meadow foam." ↓



hill species you are leaving behind. For a while the lacy, two-trunked digger pines share the slopes with solidly-foliaged, straight-boled ponderosas. But soon the furrowed, cin-

namon trunks of incense cedar and the "Christmas-tree" whorls of tall white firs replace the diggers, and the aromatic fragrance of the Transition Zone engulfs us.

Part of this aroma exudes from the conifers and part from resinous pits of a member of the rose family which grows a thick matty undercover about a foot high over the forest floor in places. This fern-leaved plant is mountain misery—perhaps named for the sticky misery it can bring to hikers who stumble over its tangled branches, which can glue socks, dust, insects, leaves, and jeans together in a tarry, strong-smelling mass. But its aroma is delightful in less concentrated form, and on worn jeans, brings many a nostalgic memory of a summer day in the pines. On this last day of May, a scattering of the strawberry-like white flowers of mountain misery still sprinkles the forest floor.

In early May, legumes had put on a spectacular show at 2,500 feet above sea level. Ivory lupines and blue lupines, a foot or more high, had splashed cream and azure all over the rusty-red roadcuts, 50 sturdy plants to a square foot of soil in sunny spots. Now green seed pods hang from these browning stems, and different kinds of lupines are in full bloom a thousand feet higher up.

The cascading snowy sprays of deerbrush climb the Sierra at about the same pace as the blue lupines—



"The California dogwood usually has five or six bracts, with unnotched tips."

in bloom around 2,500 feet the first half of May and bursting out anew near 4,000 feet two weeks later.

Succession in the lower Transition Zone meadows during May brings a gradual yielding of the early film of white meadowfoam to the onslaught of yellow composites which rule *en masse* in late May. Among the composites and in moist, sunny, roadside trickles, death camas tele-

scopes its white spires above the clumped stiff basal leaves.

At 4,500 feet, our car enters the land of current spring—deerbrush in full foamy bloom, lupines that are a sky-blue roadside blanket. In the shade of the ponderosas, the sugar pines, firs, and cedars—false Solomon's seal, and bellwort are at their flowering climax. Brilliant among them, though still immature, that

scarlet phenomenon of Sierra woods, the snow plant, pushes pine-needled humus aside to open its blood red buds, formed underground at the base of fruiting plants last August. Without green leaves, the snow plant absorbs its energy to grow from decaying organic matter in the soil.

Above the herbs, the shrub understory sprays flakes of dogwood-like, white confetti among the sunlit

forest. Like the eastern dogwood, *Cornus florida*, the true flowers of the California dogwood, *Cornus nuttalli*, lie inconspicuously in tiny central heads, surrounded by the large white bracts which resemble petals. Unlike the eastern species, the California dogwood usually has five or six bracts of larger size (eastern has four smaller ones) and unnotched white tips on the showy bracts. But east or west, no more breathtaking sight thrills an outdoorsman's eye than dogwood sprays at their snowy heights in spring. Most years their height of bloom, at 4,000 feet, is around May 15 and at 6,000 feet near May 31.

In the freshly-leaved Kellogg's black oaks above the dogwood, Calaveras warblers celebrate their arrival from Mexico wintering grounds with a sweet two-parted warbling trill—sometimes sung exultantly by the male while hovering in mid-air, his yellow throat vibrating as song pours passionately from the upturned bill. These gray-headed warblers practically follow the black oaks up the Sierra, going no higher on the slopes than the oaks grow. They use them



"Aspens have many swollen leaf buds."

"The belt of red fir is the snow reservoir of the Sierra."



only as foraging trees, and they nest on the ground amid mountain misery or other brushy cover.

Among their neighbors in this zone's abundant birdlife are the fluid-toned black-headed grosbeaks, chestnut-topped chipping sparrows, wood pewees of the nasal twang, startlingly crimson-headed, yellow and black western tanagers, California purple finches, and Oregon juncos. Often the first bird you see in the Transition forests is that rousing lookout, the Steller's jay. Alert and noisy, it signals one's arrival to all other animals and in campgrounds will take food at near range, flaunting its black crest and royal blue wings. High above the campsite, an olive-sided flycatcher darts after a flying insect.

You leave spring behind you as you follow the road up into the next higher region of the mountain where the olive-sided flycatcher really holds domain—the land of tall, dark-red firs and thin-barked lodgepole pines. Here in the Canadian Life Zone, between 6,000 and 8,000 feet, this clear-voiced, gray flycatcher with white flank patches, rings out his

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# THE WOLVERINE-

## ONE OF NATURE'S MOST MALIGNED

By Col. Robert Bruce White

AS OUR wartime C-47 made its final approach to Northway Army Air Forces Base in Alaska, a wolverine ran across a forest clearing below. He stopped, and seemed to raise his right forepaw, as though to shade his eyes from the slanting rays of the setting sun. Then, apparently convinced that our olive-drab bird meant him no good, he disappeared amid the firs bordering the clearing. Excepting this delightful incident, I claim no other firsthand experience with these animals, but this is probably more than thousands of forest rangers and trappers who have spent all their lives in North American forests can claim. Wolverines are among our rarest of wild animals and are rare also in zoos. Few words have been written in behalf of the wolverine, and it is my contention that no animal has ever been more maligned.

Even Ernest Thompson Seton, a noted American naturalist, painted the wolverine as sinister when he wrote: "Picture a weasel — and most of us can do that — a little demon of destructiveness, that small arm of insensate courage, that symbol of slaughter, sleeplessness, and tireless energy. Picture that scrap of demoniac fury, multiply that mite by 50, and you have a likeness of the wolverine." Then read the words of the conservationist, William T.

Hornaday: "(It has) the combined cunning of many generations of criminals. (The Glutton) breaks open caches, raids cabins, systematically destroys everything it encounters . . . and soils food which it can neither eat nor carry away."

How big is this fabulous creature? Smaller than a bulldog, it weighs from 18 to 40 pounds, by no means the 100-pounder one modern writer claims to have shot. Powerfully built, shaggy haired, it looks like a tiny bushy-tailed grizzly bear whose hump is amidships rather than over the shoulders. It has the face if not the figure of its cousin the weasel. And its long, coarse, chestnut-brown to blackish hair is striped on the flank with pale brown; its forehead is pale gray, its face, and muzzle, brown. Because of its looks and the nauseating odor of the fluid from its anal glands, when used in self defense, it is sometimes called a Skunk-bear. Or by the French Canadians the *carcajou*.

Time was when these "super-weasels" ranged from Maryland north to the timberline and westward through the Great Lakes region to the Pacific slope. In New England the last wolverine was seen 40 years ago; in Michigan where at least a great football squad perpetuates the name, a century has elapsed since it disappeared. Excepting a few now living in Glacier Na-

tional Park, the Sequoias, and the Sierra Nevadas (between 6,000 and 13,000 feet altitude) they are very scarce. Probably only a few score exist within our borders. On the Great Barrens of Canada; in the Kuskovin River Valley, Yukon Flats, and Mt. McKinley National Park of Alaska; in upper Scandinavia, Finland, and Russia's northern forests, a few still survive, but nowhere in abundance.

As you think of their last retreat, the High Sierras and bleak arctic tundra, it's not difficult to imagine a ravenous appetite, but gluttonizing on what? Alone and unafraid, never in mass formation, they face big odds against survival, and overcome them. Unlike bears they do not sleep away the long winter. They accumulate no stores of food for the time when blizzards rage across forest and tundra. Withstanding appalling cold or storm they range the northern wilds ever in search of food. Incapable of bursts of speed that might capture fleet-footed animals, possessing no special gifts for stalking, handicapped by vision weaker than many other predators, they tramp doggedly through the forest, covering immense distances, never missing opportunity for a snack here, a banquet there, no matter what risks are involved.

In warm weather they attempt to satisfy their keen appetites like other



Illustration by Walter Ferguson.

## ANIMALS

members of the weasel tribe, skulking through swamps and thickets after birds' eggs or young creatures that haven't yet learned to defend themselves. They dig out of underground tunnels the mice and lemmings whenever their keen noses tell them the little owners are at home. With their long, sharp, white claws they excavate fox dens, and eat the cubs they find cornered in the extremity of the den. Wasp larvae are eagerly devoured; occasionally they eat other insects, snails, frogs, and berries.

With the coming of snow they may not fare better than they do in summer, but they seem to do better than most animals. Wolves and other large predators, taught by hunger to practice the strictest economy and to cache whatever isn't immediately consumed, discover that, if a wolverine is about, no amount of clever hiding will avail; it seems to have an uncanny ingenuity in locating their buried treasures. Rabbits are probably the mainstay of the wolverine; and there is reliable evidence that they kill and eat beavers and badgers; and on rare occasion they even take caribou and moose. Scavenging is its forte — any kind of flesh found dying, or dead, and taken in its own clever ways.

Ordinarily the wolverine is not a very aggressive animal, but it will fight desperately when attacked. Re-

gardless of odds it will never retreat, and "win or die" is its maxim. Inspiring terror in the hearts of many predators, it is sovereign of its lonely solitudes. For when many larger animals encounter the wolverine, they give way — and quickly. Rangers say that a 30-pound wolverine will force a 300-pound grizzly off the trail. And on three different occasions Judge W. Fry, a highly respected ranger in the Sequoias, has observed a lone wolverine approach either bears, coyotes, or mountain lions feeding on a freshly killed carcass; and each time, the diners abandoned their kill. Whether this courageous little animal asserted its rights by voice, odor, or merely by appearing on the scene, Fry doesn't say. But the raider got what it wanted, a full meal, and without fighting for it. All of which compels my admiration — admiration combined with awe for its self-confidence, cunning, and courage.

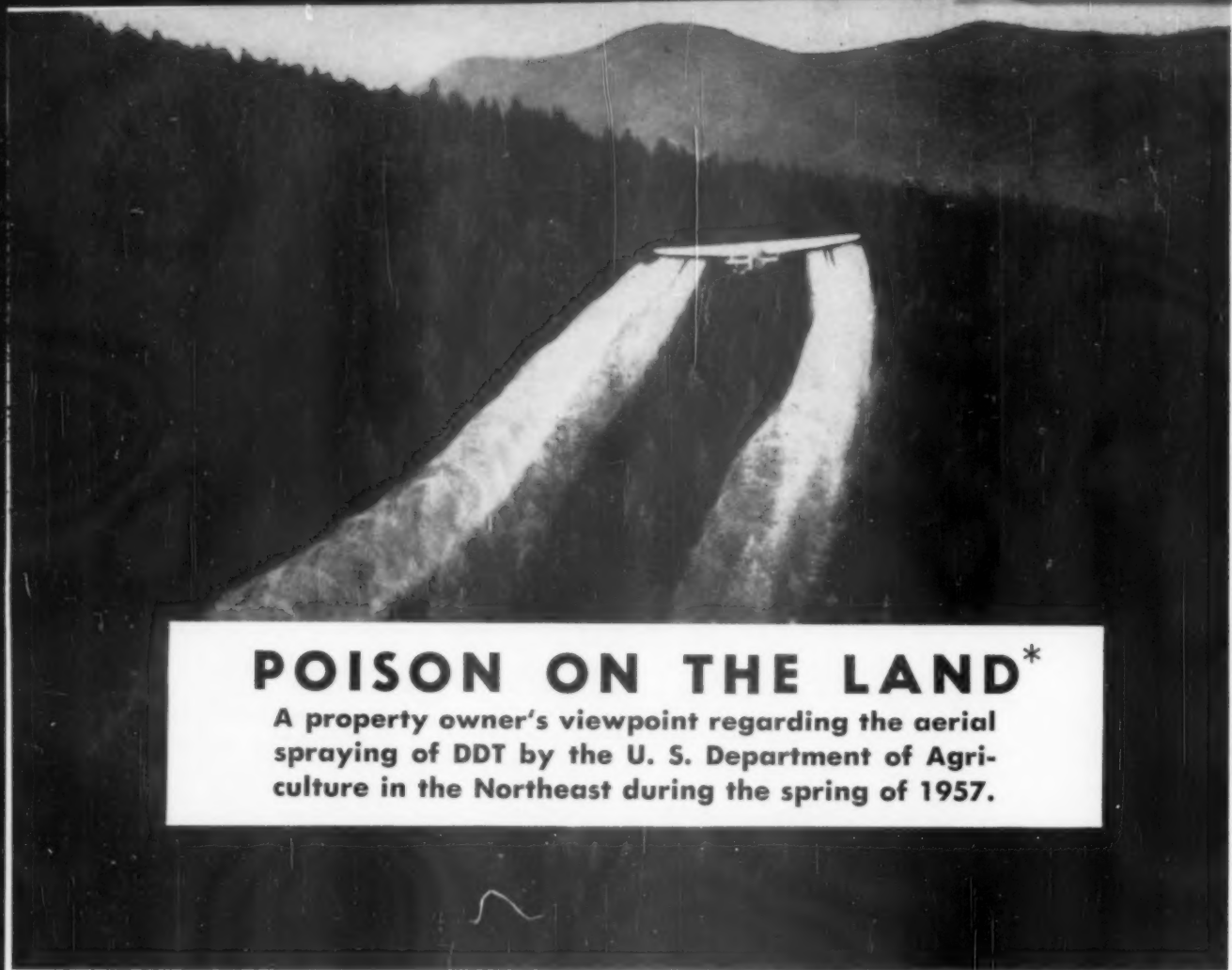
You can hardly expect fur-trappers and the Hudson's Bay Company to admire the wolverine. Its systematic taking of animals from their traps has, for centuries, exasperated trappers no end. In scores of cases a solitary wolverine has followed a line of marten traps for 30 or more miles, has approached each one from the rear, extracted and devoured the bait or entrapped victim, then sometimes has concealed the stolen trap. From the trapper's standpoint this was outrageous, but was it? Who had better right to those martens? From the wolverine's standpoint it

was a case of take or starve; to it the traps were simply free-lunch counters. So clever is the wolverine, so cleverly does it usually avoid injury to itself, that the fur companies have long advised all trappers they have but two alternatives when a wolverine appears on a trap-line: either kill the wolverine or give up trapping. In Alaska wolverines have some protection under the game laws.

Getting into trappers' cabins, caches, and other properties left unguarded in the wilderness is another trait that does not endear the wolverine to woodsmen. Fantastic tales, some true but more often fictional, are told of these raids. Remembering the broken china, ripped curtains, overturned lamps, and other havoc left in the wake of a gray squirrel in a friend's Connecticut home, I haven't any doubt that if given the opportunity a wolverine, several times larger and stronger, could cause greater destruction. Squirrels, however, do not carry away canned goods, stove lids, pots, skillets, and firearms to be hidden in the forest which certain rogue wolverines are said to have been guilty of. Nor rip up sheets and blankets to provide bedding more to their liking. On the other hand, gentle rabbits may gnaw away the cork handle of your favorite fly-rod to extract the salt of your perspiration.

The hard luck story of a Cree Indian who, decades ago, suffered the loss of his trap-line and cache of hides and supplies, his only husky

*Continued on page 84*



## POISON ON THE LAND\*

A property owner's viewpoint regarding the aerial spraying of DDT by the U. S. Department of Agriculture in the Northeast during the spring of 1957.

Photograph courtesy of the U. S. Forest Service.

By Wilhelmine Kirby Waller

**Y**OUR President has asked me to speak before your convention, as a property owner concerned with the effect of chemical sprays on wildlife and personal property.

During the last week of May and the first two weeks of June 1957, a good part of Westchester County, New York, was sprayed from the air with DDT in an oil base by order of the U. S. Department of Agriculture.

To quote from a May 1957 publication of the Department of Agriculture — "Spraying is being done in Westchester County to *prevent* the movement of the gypsy moth into the area and into the South, where it would do millions of dollars worth of damage. One pound of DDT dissolved in one gallon of light oil is applied to each acre of land sprayed, and at this concentration the DDT spraying is harmless to people or property." Please notice in this quote that in Westchester County the spraying was being done as a *preventive* measure, *not* to eradicate an existing pest.

\* An address presented by Mrs. Waller at the 53rd Annual Convention of the National Audubon Society, November 11, 1957, New York City, N. Y.

We live on a 200-acre farm situated in the Township of Bedford which is in the northern section of Westchester County. My own experience with this spray program commenced at the time that Rockland County which adjoins Westchester, was being sprayed and we were informed that Westchester would be the next on the agenda. I called by telephone the head personnel of the Department of Agriculture in our area, namely, a Mr. Pierce at Poughkeepsie and a Mr. Toomey at Pleasantville, and I telegraphed Mr. Emory D. Burgess, Chief, Plant Pest Control Branch, U. S. Dept. of Agriculture, South Building, Washington 25, D.C., requesting that our farm not be sprayed. I further said that we would assume the expense of having our property checked for the gypsy moth and if any were found, we would destroy the larvae by spot spraying. I explained that the topography of our land was such that it would be absolutely impossible to spray the scattered woodlands and swamps without also dousing our pastures.

**I** was assured both over the telephone and in press releases from the Department of Agriculture that no farmland would be sprayed. Notwithstanding this, on June 3, between the hours of 6:00 and 8:00 a.m., our entire

property was sprayed. I immediately telephoned the Department of Agriculture office in Poughkeepsie and was told that it was unfortunate that our farm had been sprayed but that no property would be sprayed a second time—so our worries should be over. The next morning, June 4, between the hours of 6:00 and 8:00, our property was again directly sprayed. Twice during the remainder of that week, when the area to the east of our farm was sprayed, drift spray blew over our property. Therefore, the Department of Agriculture misinformed us twice—first in saying that no farmland would be sprayed, and second, in telling us that property would be sprayed but once. As a direct result of this dousing with DDT in an oil base, we encountered the following damage and destruction on our farm:

Milk samples taken from our herd of purebred Guernsey cows 48 hours after our pastures were sprayed, were analyzed by the Laboratory of Industrial Hygiene, 54 West 31st Street, New York City. Fourteen parts per million of chlorinated hydro-carbon (DDT) were found in the milk, and analyses of forage samples taken from the fields in which the cows grazed showed 5.4 parts per million of DDT.

In this connection it should be noted that just prior to this spraying, the United States Public Health Service issued an order forbidding the use of all chlorinated hydro-carbon pesticides around dairy cattle, stating that it had been found that children and infants were especially susceptible to DDT poisoning. We sell our milk to a local dairy and when the analysis report came in, we called the Department of Health in White Plains and asked how much DDT was permitted in milk that was sold to the public. The answer we received was "none." Upon reporting the content of chlorinated hydro-carbon in our milk and asking if this was sufficiently high to be dangerous for human consumption, Dr. Goldman of the Westchester County Department of Health simply replied, "I do not know." No steps were taken by the department to keep us from selling our milk, and we have continued to do so.

Now let us turn to garden produce. We freeze large quantities of vegetables and for this reason maintain a vegetable garden of considerable size. At the time that our property was sprayed, our spinach crop was ready to be picked. However, its leaves were so burnt and spotted as a result of the spraying, that we were unable to salvage any for freezing. Luckily our peas were not as yet ripe but samples of peas grown by Mr. Burleigh Horan, who is in the truck gardening business at Lloyds Neck, Long Island (which was also sprayed for gypsy moth control), were found, upon analysis, to contain DDT residues in the range of 14 to 20 parts per million. The safe limit of tolerance of human beings to DDT on peas, as established by the U. S. Commissioner of Foods and Drugs, is seven parts per million and Mr. Horan's peas were therefore considered unsafe for human consumption. The analysis of Mr. Horan's peas was done by the Agricultural Experiment Station of Cornell University at Riverhead, New York.

In our garden we also had some unusually fine white peonies and were planning to show some of the blooms in a local flower show. This proved impossible as after the spraying, the petals of the flowers were too spotted and burnt for the peonies to be exhibited. We are also

confident that because of the blanket DDT spraying, numerous plants suffered damage due to the destruction of many pollinizing insects.

Death came to many forms of wildlife on our farm as a direct result of the spraying. We found seven dead bumblebees within a small section of the garden, notwithstanding the fact that on May 22, the U. S. Department of Agriculture in a mimeographed bulletin stated that the gypsy moth spray was harmless to bees.

We found during the period of from 48 hours to a month after the spraying, the following dead birds: two goldfinches, one Baltimore oriole, and five starlings, and, in addition, three obviously sick pheasants. We had no analysis made of the dead birds on our property but some landowners who sent birds to a laboratory received reports of a DDT content in them as high as 37.8 parts per million.

In connection with our birdlife, I had a rather interesting experience. One of my jobs on the farm is to shut in the chickens each night. After doing this on the evening of the second day during which our farm was sprayed, I brought some scratch feed up from the chicken house at about nine o'clock at night and put it on the flagstones in front of our house so that it would be there the following morning for the birds to eat. Within five minutes a flock of birds appeared out of the dark and commenced devouring the feed. Something is radically wrong when wild birds feed after nine o'clock at night.

After the spraying, our farm pond appeared to be a lifeless body of water. The only fish we saw were a few dead ones; the usual complement of frogs were missing and no water-striders ran back and forth over the water's surface. Even during the fall of 1957, six months after the spraying, we saw neither frogs nor water-striders. We have always enjoyed our tree toads and considered their noisy voices a definite promise of rain. Since the day our property was first sprayed, we have heard no tree toads sing. Likewise we saw no lady-bird beetles during the summer and fall of 1957, and, assuredly, thousands of other insects that are parasitic and predatory on the gypsy moth, were killed.

One of the chief activities on our farm is the raising and training of thoroughbred horses. Many of them were in their paddocks the morning the first plane went over dumping its load of DDT. The horses were obviously terrified by the noise of the low-flying planes, which, though the orders to pilots were to fly at 500 feet, were in many instances but 100 feet from the ground. Thoroughbred horses panic easily and luck was with us that none of ours ran through the paddock fences in fright. Ten minutes after the spraying we had every animal on our property brought back to its respective barn and the water troughs in each paddock emptied and washed. Our livestock, therefore, suffered no apparent ill effects, as they drank no water which had been subjected to spraying. However, a quarter horse, which belonged to Mr. Harry Tuthill at Setauket, Long Island, and appeared to be in the best of health, died 10 hours after drinking from a trough which had become filmed with oil and DDT when the field in which the horse had been pastured was sprayed.

While on the subject of water: the swimming pools in our area were, of course, liberally doused with DDT and oil. Because of the repeated sprayings, many pools

had to be emptied and refilled several times. Dr. Daniel Brown of the Mount Kisco Medical Group in whose hands the health of much of our community rests, advised that all pools subjected to spraying be drained and flushed. This past summer was, as you know, an unusually dry one in the Northeast, and to refill pools several times was a heavy drain on our local water supply.

Now to summarize the damage on our own property: our milk and pastures were contaminated — our spinach crop ruined and our peonies spoiled — our horses were dangerously frightened by low-flying planes — our fish and other pond life and many valuable predatory and parasitic insects killed, and our wild birds definitely affected.

But our chagrin and sorrow goes deeper than this visible damage.

First, we question the right of the U. S. Department of Agriculture to carry out a program the far-reaching results of which are still an unknown factor. It is interesting to note, in a release from the U. S. Department of Agriculture, dated May 10, 1957, that the Fish and Wildlife Service of the U. S. Department of the Interior is listed as one of the three agencies which state on the basis of many years' experience with DDT, and I quote, "that this insecticide when used in the manner specified for eradication of the gypsy moth is not injurious to man or farm animals, offers slight if any hazard to birds and other wildlife, and is not likely to have any serious effect on fish population in the sprayed areas."

Assistant Secretary of the Department of the Interior, Ross L. Leffler, a conservationist for whom I have great admiration, despite this statement, has asked Congress to support a bill introduced by Congressman Lee Metcalf of Montana (HR783) that would require a comprehensive federal study of what the use of billions of pounds of chemical pesticides is doing to the nation's wildlife resources. Mr. Leffler also states that the 1958 budget for his department contains a request for funds to carry out this work.

When the U. S. Board of Health tells us that they don't know whether milk containing 14 parts per million of chlorinated hydro-carbon is harmful; when reputable doctors tell us to empty, flush, and refill swimming pools which were sprayed with DDT before swimming in them; and when chemists, scientists, and natural-

ists repeatedly speak of the debilitating and cumulative poison contained in DDT, there is far too much doubt and controversy concerning its use for any government agency to embark on a spray program which subjects all forms of life to what many believe to be dangerous poisoning.

Second, we strongly object to the manner in which the program was carried out. The planes flew considerably lower than the 500 feet required by law, and they sprayed property not once but in some instances as many as 15 times. Affidavits are on file to this effect. No advance notice as to the time of spraying was given, nor was such obtainable from any source. The only apparent interest which the U. S. Department of Agriculture took in the complaints of property owners was to send a representative from the department to find out if the owner planned to bring suit for damages.

As a matter of record, the U. S. Department of Agriculture stated in official releases that planes would fly at 500 feet when spraying property — they stated that no farmland would be sprayed, that each area would be sprayed but once, and that advance notice would be given when a property was to be sprayed. Each of these statements in so far as our experience was concerned proved to be false — and I agree with Dr. Robert Cushman Murphy's statement that in all our history there is no more flagrant case of a bureaucratic attitude signifying "the public be damned."

Nature never takes man-made ecological changes lying down, and we can expect an assortment of kickbacks from this spray program. I personally feel that it is just as morally wrong to upset the balance of nature as it is to desecrate a church. All life is dependent on the balance of nature and man upsets this balance to his own peril.

I have always been proud of being an American — proud of the freedom of thought and action so largely responsible for this country's greatness. But since the blanket spraying of personal property last spring, and the manner in which the U. S. Department of Agriculture carried out the spray program, I have been just a little less proud of this country, for it seems to me that there is something in the air that smacks of dictatorship — a type of government never heretofore associated with our American way of life.

—THE END

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## Effects of Chemical Sprays on Wildlife\*

\*An address by Dr. James B. DeWitt, U. S. Fish and Wildlife Service, Laurel, Maryland, presented before the 53rd Annual Convention of the National Audubon Society, in New York City, November 11, 1957.

By James B. DeWitt

DURING the past 12 months, some 35,000,000 pounds of arsenic salts, 45,000,000 pounds of copper sulfate, 6,000,000 pounds of organic phosphates, and 130,000,000 pounds of chlorinated insecticides have been used to protect agricultural and forest lands against damage by fungi and insects, to abate the nuisance of biting insects, to control flies and other insect vectors of disease, and to insure that our foods do not contain insect and

fungal contaminants in excess of limits imposed by state and federal laws. In the course of efforts to achieve these laudable objectives, the pesticides in some instances have been applied directly to wildlife habitats.

It has been recognized that most pesticides are more or less toxic to vertebrates, and steps have been taken for the protection of man and domestic animals. Under Public Law 518 of the 83rd Congress, tolerances have been established for pesticide residues in foods, and materials exceeding these limits are judged unfit for human consumption. Users of pesticides are instructed to allow suitable periods of time to elapse between application and the harvesting of crops or pasturing of treated areas.

These protective measures are ineffective in the case of wildlife. Birds, fishes, and mammals may be exposed to the freshly applied sprays or toxic residues. Wildlife foods may be contaminated to an undetermined extent, and no way has yet been devised to prevent consumption of these deleterious substances. Under the circumstances, it is apparent that widespread application of pesticides *might* result in damage to wildlife values, and various reports have established that *some* damage has occurred in *some* instances. Estimates of the actual extent of this damage have ranged from negligible to extremely heavy.

In its role as conservation agency, the U. S. Fish and Wildlife Service has endeavored to appraise these reports, to conduct investigations of the toxicity and potential hazards of various pesticides, and to aid in the development of information, methods, and materials which would permit adequate pest control combined with minimum damage to wildlife. The work has involved laboratory studies to determine effects of acute and chronic poisoning, field studies under controlled conditions, and observations of large scale operations conducted by others.

Since the chlorinated insecticides which include some highly toxic materials are widely distributed and leave persistent residues, attention has been concentrated upon this class of materials. DDT has been studied more extensively than any other compound in this group, and

as early as 1946, Coburn and Treichler had reported on its toxicity to various wildlife species. In the same year, Hotchkiss and Pough showed that aerial applications of one pound per acre to forest areas had little effect upon bird numbers, but that five pounds per acre produced heavy avian mortality. R. E. Stewart and co-workers found that single applications of two pounds per acre did not cause serious damage to most birds, but indicated that some species were more susceptible than others to the effects of this insecticide. Goodrum, Baldwin, and Aldrich also found relatively slight damage following use of two pounds per acre. Benton reported that spraying for control of Dutch elm disease produced little mortality in adult birds, and presented limited data indicating damage to nestlings. Mitchell, Blagbrough, and Van Etten also found damage to nestlings under conditions where adult birds apparently were unharmed by applications of three pounds per acre.

These findings, based upon observations of single applications, indicated that relatively little damage to birds occurred when application rates did not exceed two pounds per acre. However, DDT is a highly stable compound, and residues remain toxic for extended periods. It is cumulative in action, and the effects of prolonged exposure, or of repeated small doses, may be equal to those produced by a single massive dose. C. S. Robbins and co-workers showed in 1951 that although a single application of two pounds per acre had little effect on bird populations, five such applications at yearly intervals reduced numbers of nesting birds by 26 per cent. This suggested the possibility that the compound had effects not discernible in short-term observations, and laboratory studies were instituted to explore this point.

The experimental outline called for feeding known amounts of DDT to breeding quail and pheasants, rearing the progeny of these and other birds upon diets containing the insecticide, and determining reproductive efficiency in the second and third generations. Preliminary experiments showed that quail could be reared and maintained for extended periods on diets containing 100 parts per million of DDT, but

that young pheasants were killed by diets containing more than 50 parts per million. These, and higher levels were used in the initial breeding experiment.

Details of the results of these experiments have been presented elsewhere. It was found that feeding 200 parts per million of DDT to breeding quail had no demonstrable effect upon production, fertility, or hatchability of eggs, provided the birds had not been exposed to the insecticide prior to the start of the reproduction period. However, viability of the chicks was affected, and more than 87 per cent of the chicks died in the first 12 weeks, even though these young birds were fed insecticide-free diets at all times. Similar results were obtained with birds which had received 100 parts per million of DDT throughout life. No chicks from these birds survived when fed diets containing 100 parts per million of DDT, although chicks from normal parents survived at approximately normal rates when fed at this level. Feeding breeding pheasants at a level of 50 or 100 parts per million reduced egg production, but had no apparent effect upon fertility, hatchability, or chick survival.

It must be emphasized that these findings were made under laboratory conditions, and that it is not possible to establish precise relationships between them and conditions which might be encountered in the field. The data indicate that if aldrin were uniformly applied at the rate of one pound per acre, each square foot would contain sufficient toxicant to kill two adult quail, 20 quail chicks (two weeks old), or five young pheasants. Reproduction, and growth of young birds, might be affected at appreciably lower levels.

In summary, then, the available field and laboratory data support the conclusion that widespread, heavy, or improper use of chlorinated insecticides may damage bird populations by direct mortality, or through impairment of reproductive functions. The extent of damage is proportional to the acute and chronic toxicity of each pesticide, the rate of application, and the persistence of residues. The data are far from being complete, and much additional work is needed to determine the over-all or long-range effects of the spraying operations. —THE END

# *The Clapper Rail*

The "guinea-hen" call of the clapper rail is a characteristic sound of our coastal salt marshes.

Clapper rail on its nest and eggs, photographed by Allan D. Cruickshank.



By Henry Marion Hall

LIVING neither on the land nor on the sea but partly on both, clapper rails are the green god's chickens—the wildest, most raucous poultry on our planet. They owe allegiance only to the divinities of the ocean, remaining as indifferent to man and his ways as if they were in a different world. We realize this when all the rails in a marsh sound off in concert, loud and vibrant as guinea-hens—"kak-kak-kak-kaka!"—commencing extremely loud, as if the whole meadow were expostulating against something, but ending more slowly and gently. This is the voice of the salt wastes themselves—free, savage, and utterly independent. When marsh hens sound off that way, one might easily imagine that every one of them had laid an egg and was telling the seaside world about it.

The clapper rail\* inhabits the tidal marshes from Maine to Florida, and from that great peninsula all the way to the Golden Gate of California. Its lateral range is limited by the east-west expansion of salt meadows and the brackish creeks. The bird thrives wherever barrier islands hold off the ocean from this belt, particularly when the protected waters are crowded with rustling blades.

Such, for example, are the measureless Marshes of Glynn, so eloquently sung by the poet Sidney Lanier. As we cross the Savannah River headed south we suddenly face that incredible panorama. Not even the swamps of the Nile, nor those encircling the Lake of Tunis in Africa support comparable reedy seas. Our Atlantic coast is rich in such areas, from the tip of Cape Cod to Florida Keys and a thousand miles beyond. Nothing on earth is quite like some of these saltings, brighter than emeralds—the one and only genuine sea-green. To keep them verdant Neptune rolls back his floods every 12 hours and drowns them deep. When the tide ebbs

once more, they emerge more lustrous than ever.

No other species is better adapted for concealment in its chosen haunts than the clapper rail. The plumage of its back and shoulders, ashy gray streaked with brown, and that of its breast, russet paling into grayish on the flanks, are practically identical with typical surroundings—the floor of the marshes littered with faded reeds. For this reason you seldom sight a rail unless it moves. Even then one's eyes are so baffled by its pattern that the observer might think a bit of the marsh is slipping away. Watch a blacksnake whipping into a bush. It flows along so smoothly that the eye can scarcely record when the last inch of tail has vanished. In like manner the rail slips away into the heart of the marsh. One moment you think you still discern it, but the next it is gone.

An effective auxiliary protective pattern is the array of light bars running at right angles to the axis of the bird across its dusky flanks, striping all its underparts except the center, which is gray. Close range study of these birds suggests that the white streaks across a blackish ground resemble the colors of the salt marsh near the bases of the reeds where the rail spends most of its life. The stripes match the stalks when the bird crouches or stoops forward, threading its way amid the tangle. This bizarre striping, totally different from the rest of the plumage is found on all rails, and may be an adaptation to background typical of this group of birds.

Clapper rails rely largely on movement when in danger. In their peculiar environment they can evade their pursuers more readily by running than by standing still or by flying. Scampering through dense rushes for ages has developed their legs at the expense of their wings. Their flight is notably weak and slow, far too slow to enable them to evade a hawk towering above the ocean of grass in the salt meadows. Such open expanses afford few shrubs or trees in which a fugitive rail might dodge pursuit.

As life spent in the marsh has developed protective coloration and

the legs of a sprinter, so it has likewise molded the form of the clapper rail to suit its chosen haunts. Its breast is sufficiently wedge-shaped to slip between close-growing rushes, from which fact originated the familiar comparison, "thin as a rail." In like manner the toes have grown long and spreading, so as to ensure safe passage across quaking bogs without loss of speed. The feet resemble those of other marsh-haunting species, such as the Florida and purple gallinules and the Mexican jacana.

At low tide clapper rails feed on the oozy flats, but when caught by rising water they sometimes find it necessary to swim. A slightly membranous structure between the bases of their toes enables them to do so whenever the need arises. Not only do these birds swim readily, but they teach their young to do the same. Like most water birds they can also dive. Once in a while, when suddenly attacked, a clapper rail will plunge and avoid surfacing by allowing only the tip of its bill to protrude from the water. This is the same ruse so frequently resorted to by the pied-billed grebe. By gripping the base of a reed the rail can hold itself submerged and remain practically invisible until peril disappears.

The clapper rail is so completely master of its environment that it usually avoids taking to the air when disturbed. I once pursued one in a duck-boat on a Long Island creek. The rail had ventured into shoal water, perhaps three inches deep, where the sedges were sparse, so I tried to make it take wing. It readily evaded me by skulking from one strip of half-submerged grass to another. Here and there it swam a little, eventually flushing only because I kept almost at its heels. In this case, as in many others, I noted that the rail trusted more to its legs than to its wings.

Nevertheless I have flushed them occasionally. Three times in one morning I almost stepped on clapper rails lurking in reedy troughs running into the main creek below Bellmore, Long Island. In every case the bird fluttered up rather weakly and flew straight away with its toes

\* According to the A.O.U. Checklist (Fourth Edition, 1931) and its supplements published in the *Auk*, there are about 10 subspecies of the clapper rail, *Rallus longirostris*, in the United States. They range from the Atlantic Coast west to California and south into Lower California.—The Editor

dangling. I managed to flush one several times, but the others sprinted swiftly out of sight the moment they pitched. Such daylight flittings are short, the rail dropping down to hide just as soon as it sees cover. But at night, during partial migrations, clapper rails twinkle steadily along on their short wings at no great height. They steer parallel to the water, like wildfowl, but show no traces of the feebleness so notable in their occasional flights by day.

Clapper rails have many natural enemies. Broken nests, scattered plumage, and well-sucked eggs, together with telltale footprints in the mud, suggest that bobcats, opossums, skunks, minks, and raccoons make many a successful raid. Once in a while, too, the rather slow, red-tailed and red-shouldered hawks manage to catch these birds, and swift "blue darters" (Cooper's hawks) account for a few. Large fishes, snakes, and sea turtles also take their toll. In the deep south a single cottonmouth moccasin has been known to swallow all the eggs in a nest and the brooding bird with them.

Far more destructive than any of these living agents are the northeast storms which sometimes drive the ocean in over extensive breeding areas. Such tempests have drowned innumerable mother rails which are so devoted to their nests and eggs that they will often perish rather than desert them. In the days of greatest rail abundance the dead bodies of the females used to strew the shore after a big storm. Nowadays the nesting areas of clapper rails have been greatly depleted, but even so the hurricanes along the Atlantic Coast in August and September 1954, and of September 1955, destroyed hundreds of these birds.

Despite all these natural dangers clapper rails multiplied exceedingly until man invaded their haunts. His coming started a notable decline in their numbers. On the high tides at the time of a full moon, gunners decimated them. Sitting in the bow of a flat-bottomed boat paddled by an assistant they would shoot great numbers of rails which had climbed to the tops of reeds to escape the water. Fortunately for the birds this kind of "sport" has declined in popularity.

Clapper rails lay large sets of

eggs, and sometimes, in southern marshes, two clutches in a season. Many of the second clutches may be due to the rails' persistence after the destruction of first settings by some unusually high tide. The birds are everywhere prolific enough to overcome all handicaps if given half a chance.

The nests of this species are sometimes well concealed but not invariably so. On the south shore of Long Island they are usually grassy platforms raised in the rushes just suf-

ficiently to keep the eggs safe from the tides. Some are screened by canopies woven of dead reeds, and all are somewhat hollowed. Flotsam conceals some nests, but others may be sighted from a rod or so away. Even the eggs show protective hues—glossy buff spotted with reddish brown, lavender, and gray, closely matching the nest cavity itself.

Similar nests may be seen on such places as Cobbs and Wreck Islands off the coast of Virginia immediately south of the eastern shore of Maryland, where small colonies persist. Wreck Island is an ideal refuge for these birds. On the ocean side, sand banks, anchored by beach grass, form a barrier—low but adequate to protect the isle. The inland parts are largely meadows, veined by creeks and subject to partial inundation at high tide. Adjacent higher stretches are shaggy with bushes in which a colony of little green herons build their stick nests, sometimes as many as two or three in a single blueberry thicket. There, too, Florida grackles nest in large numbers.

I observed many rail nests in the marsh on Wreck Island on my first visit there—practically all of them a bit conspicuous because elevated above the reach of the water. Clapper rails frequently build several nests but lay eggs in only one. Although none of the grassy cradles looked old, they were all empty. It was then the middle of the nesting season and far too early for such an array of tenantless homes to be found. A partial explanation may have been a nestful of young fish crows in a lone tree, barely 10 feet high, in the center of the colony, but clapper rails are so pugnacious that I doubted whether the crows had eaten all the eggs. Clapper rails often jump up and strike savagely at marsh hawks which happen to skim low over their reedy homes.

However, fish crows are very crafty and contrive to get eggs from rookeries whenever the brooding birds leave them unprotected. On Devilfish Key off the southwest coast of Florida I have frequently seen cormorants chasing fish crows among the mangroves.

The safest nests seem to be mere depressions in the tall grass located several rods inland from high water on the seaward side of the island.

#### The Whooping Crane Honored by a Postage Stamp

The whooping crane postage stamp was issued in late November, 1957 as the fourth of a series commemorating wildlife conservation. The earlier ones featured the wild turkey, antelope, and salmon. The whooping crane stamp depicts two adults with two small chicks, and is in three colors—unusual in the three-cent denomination. It has received widespread acclaim and is being used in large numbers. If the local post office can no longer supply it, sheets of 50 may be ordered from the Philatelic Office, Post Office Department, Washington 25, D. C. We urge members and friends to use this latest stamp to publicize the second most rare North American bird as well as take advantage of a stamp beautifully designed by Bob Hines, famous wildlife artist.

#### New Conservation Booklet Available

The Soil Conservation Society of America announces a recent publication—*Land Utilization in the United States*. The publication is actually a series of reprints from the *Journal of Soil and Water Conservation* and a summary of a symposium on the subject presented at the Society's eleventh annual meeting, October 15-17, 1956.

We thought you would be interested in this subject and would perhaps have the opportunity to announce it to your members via your publication. The booklet is available from us at the prices\* shown below.

Problems of exploitation, conservation requirements, inventories, rural and urban planning, wildlife, economics, and changing land patterns are discussed by the various authors that participated in the discussions.

\* Single copies, 50 cents; 10 copies, \$4.50; 25 copies, \$10.00, etc.

H. WAYNE PRITCHARD  
Executive Secretary

The Soil Conservation Society  
of America  
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Des Moines 14, Iowa

These are well concealed by weeds and flotsam. I was once drawn to such a home by seeing two clapper rails fighting fiercely—jumping and striking at each other's throats like game-cocks. They proved to be a mother bird guarding three eggs against an intruder which scam-

pered away on my approach. The intruder showed extraordinary fleetness of foot but did not attempt to fly. The mother bird threw herself on the grass at my feet—not on her breast but on her side—and lay there motionless, as if hoping to escape notice.

She must have been playing 'possum. The instant I stooped, the rail sprang up and dashed into a patch of tall grass about three rods distant. About a hundred paces from the first nest I discovered another which contained 16 eggs, almost a record number for the species.—THE END.

## ★ ★ ★ NATURE IN THE NEWS ★ ★ ★

Following is a reprint of a news release issued by the National Audubon Society early in January 1958. The information in this release was used by the *New York Times* and other newspapers as a basis for news stories about the Society's campaign against the large-scale spraying of deadly insecticides aimed at the gypsy moth in the Northeast, and the imported fire ant, *Solenopsis saevissima richteri* in the Southeast.

—THE EDITOR

### Insecticides are Threat to Humans and Wildlife

The National Audubon Society has urgently recommended that the Department of Agriculture stop all insect control programs in which highly toxic chemicals are broadcast unless incontrovertible evidence becomes available that no serious damage to human and wildlife resources will result.

The Society specifically requested the Secretary of Agriculture to stop the proposed control program for the imported fire ant on some 20 million acres in nine southern states. The program is already underway.

At the same time, the Society warned the general public that all use of highly toxic modern insecticides, fungicides and so-called pesticides by governmental agencies, farmers, and other land owners, including gardeners, carries with it a much higher potential of harm to human beings and wildlife than is generally recognized.

"Insecticide hazards may well rank in seriousness of adverse effects with the dangers of radioactive fallout," said Mr. John H. Baker, President of the Society. "The use of toxic chemicals for the purpose of protecting agricultural and forest crops has now skyrocketed to the point where cumulative secondary poisoning of human beings and wildlife, which already exists to some extent, may become catastrophic."

Mr. Baker cited tests conducted by the U. S. Fish and Wildlife Service, which reveal that in the second genera-

tion of exposure to insecticides in their diet, birds invariably become incapable of reproduction. "When you realize that these poisons may well have similar cumulative effect on the human system, it is unthinkable that widespread programs be undertaken in the absence of proof that there is no risk of such result," said Mr. Baker.

"In any case, the burden of proof should rest on the agency employing the toxic substance, and not on the individual citizen," he said. "This proof should be available for public evaluation long before mass-spraying programs are undertaken. To make such tests concurrently with a chemical spraying operation is obviously highly unsatisfactory, for the damage will have been done by the time the tests are complete."

With specific reference to the fire ant program, the Society stated that the chemicals proposed for use are far too lethal for widespread aerial or ground applications. According to the U. S. Department of Agriculture, dieldrin, one of the most deadly of modern insecticides, is to be applied at the rate of two pounds per acre. In some areas the dosage may reach four pounds to the acre, the Department says.

Tests by the U. S. Fish and Wildlife Service show that one pound of dieldrin has sufficient toxicity to kill approximately four million quail chicks. The California Department of Fish and Game reports that only 1½ pounds of dieldrin per acre caused the death of pheasants, quail, gophers, snakes, jack-rabbits, dogs, chickens, geese, and turkeys.

In calling attention to the fact that some, if not most, of the chemicals would be applied by aircraft, the Society stated experience shows that it is impossible to apply chemicals from the air without some multiple doses and complete misses.

"The National Audubon Society recognizes the seriousness of the fire ant problem," said Mr. Baker. "We can well understand that citizens of the affected states are eager to have this troublesome insect controlled. But we

doubt very much that they would be eager to have their countryside doused with these lethal chemicals if they knew the extent to which they, their livestock, and those that consume the crops produced in the area may suffer."

—THE END

(Reprinted from *The Pilot*, Southern Pines, North Carolina, Dec. 12, 1957)

### SAVE THE BLUEBIRDS

Our favorite Tarheel nature writer, Roy Parker, Jr., of Ahoskie, notes in the *Bertie Ledger-Advance* that the State Federation of Women's Clubs and other organizations are concerned about the many bluebirds that die in the flues of tobacco barn oil burners.

Many of these burners, he points out, have tee-shaped flues which appeal to bluebirds as nesting places, but when they go into the flues, they are trapped, falling through the downpipe into the heating tunnels inside the barn.

It's reported that thousands of bluebirds are dying in this way in the tobacco country and it's recommended that farmers screen these flues to keep the birds from getting into them when the barns are not in use during the nesting season.

The Women's Clubs are working on the problem, too, from another angle: they're promoting the sale of bluebird houses as part of a state-wide "Save The Bluebird" campaign.

Sounds to us like a good project for Miss Flora McDonald and her Home Demonstration clubs throughout the county. That would be taking the problem right to the ladies who could get the job done; those who live on farms.

Just how big a problem tobacco barns as bluebird traps are around here, we don't know, but we have heard of a few such instances and there may be many more. Anybody have any information on this subject?

The bluebird, with his wonderfully sweet call, "*Bermuda*," and his friendly habit of building close to the habitation of man, when he has the opportunity, is one of the most likable of the songbirds. We hope the campaign to eliminate barn death traps is successful.



"Until I was 36 years old, I had never seen a toad catch an insect," American toad darting out its tongue at a mealworm, photographed by George Porter.

## Our New Friends – the Toads

By Grace Hicks

*A discovery that in  
the homely toad one  
may find a great  
deal of charm.*

UNTIL a few years ago, I considered toads to be obnoxious creatures. My entire knowledge of them was confined to a few misconceptions based on superstitious, ignorant ideas handed down by past generations. The poor ugly creature was supposed to cause warts, and its bite and saliva were said to be poisonous. Nothing could be further from the truth.

We were sitting on the back steps of our Illinois home one hot summer evening. The backyard light was on. Directly under the light, a sidewalk runs along the east side of our smoke-house, smoke-shed, or summer-kitchen, which is a favorite haunt for our toads. We consider them pets, although we have made no effort to tame them. The first time we saw the toads there were two. Directly under the light where the insects gathered at night, we first noticed

them. I thought toads were supposed to be slow and clumsy in their movements but there is nothing clumsy about the way they catch insects. First one, then the other made its way toward some unsuspecting insect that had alighted on the sidewalk. Suddenly, without warning, the slim long tongue shot out. The insect was caught in the sticky fluid on the toad's tongue and in a flash, retracted into its mouth. Its aim is so accurate that it seldom misses. In an instant the toad had swallowed its victim and was back for more. Both of our new-found friends were busy all evening.

A toad will stay in one place as long as the supply of insects holds out, or until its stomach is so stuffed it cannot hold another. Until I was 36 years old I had never seen a toad catch an insect, but my husband and I and our small children spent that

first evening I had noticed them, watching the pair. When they finally dragged their thick, bulky bodies away on their short legs, we thought it had been a very entertaining performance.

We watched them several other times that first summer. When cool weather came they disappeared. The next spring when I was spading the ground to plant a strawberry bed near the house, I dug up a toad that seemed to be hibernating. It was stiff and I thought at first that it was dead, but I gently laid it out on the grass in the warm sunshine. Later, when I returned to look at it, it was gone. I shall always wonder if it was one of my friends from the previous summer.

Each year, with the arrival of warm summer evenings and the insects, our toads have returned. Sometimes we see tiny toads no larger

than the end of my thumb, frequently we see toads of various sizes near the house. They apparently have no fear of us. We used to see them go into a hole under the steps of the back porch. Once we saw a toad try to go into the hole but it was too large to get in. Perhaps it had eaten too many insects for dinner.

We have taught our children such respect and liking for toads that when our dog snapped at one and injured it slightly, our son who was then five, ran into the house in tears crying.

"Mommie, Brownie bit a toad and it is all hurt."

I have watched many different kinds of animals—insects, too—but I have never found any more interesting than those I met that summer evening when I first became acquainted with my new friends—the toads.

—THE END

"Each year, with the arrival of warm summer evenings, our toads have returned." Photograph by Hal H. Harrison.



# THE PRESIDENT

By John H. Baker

President of the National Audubon Society



# REPORTS TO YOU

## Official Attitudes on Insecticidal Spraying

With reference to the news release about broadcasting of toxic chemicals and damage to wildlife (see page 75) we have received a very high percentage of response from those to whom copies were sent, such as 42 per cent of the governors, 25 per cent of the senators, and 38 per cent of the heads of fish and game or conservation departments; also 21 per cent from state agricultural departments. Certain conclusions may now be drawn such as:

(1) Most of these responses constitute far more than mere acknowledgments, indicating unusual degree of personal and official interest.

(2) Almost without exception the defensive letters come from federal and state agricultural departments, state plant boards, and agricultural research stations, all presently engaged in control.

(3) Almost without exception these defensive responses concentrate on immediate killing effect on the particular insect target; to equal degree they carefully avoid reference to cumulative effects or chronic toxicity, the highly damaging potential effects of which on wildlife, domestic livestock, and human beings, constitute the main burden of the National Audubon Society's protest.

Indicative of the trend are two important items of news of the past month. The State of Connecticut declined invitation from the U. S. Department of Agriculture to participate with it this coming spring in renewal of the gypsy moth control campaign which created so much public protest in the spring of 1957. Then the Food and Drug Administration in Washington, acting on the recommendations of a special advisory committee of the National Academy of Science, set a zero tolerance in milk for the insecticide methoxychlor. In making the recommendation the advisory committee stated that a greater margin of safety must be established for pesticide tolerance in milk than in any other item in the American diet. We anticipate numerous comparable developments in 1958.

There is some tendency on the part of the writers of defensive letters to infer or assume that the Society is concerned only about fire ants, whereas we are concerned about whatever specific insect target or other wildlife in the sprayed area is subjected to mass spraying with toxic chemicals. Certainly the burden of proof that chronic toxicity is not harmful rests upon the poisoners. That they do not have factual information on cumulative effects is causing great concern. To your Society, it seems extremely important that a sufficiently broad-scale basic research program be promptly initiated by the federal government, but not by the agencies responsible for the control programs.

The Committee on Fish and Wildlife, advisory to the U. S. Department of the Interior, met last mid-November

and unanimously adopted the following recommendation:

"The Committee recommends that the Department of Interior set up a special research program to determine the effects of the many hundreds of chemicals used for animal and plant control purposes. This program should be on a scale commensurate with the urgency of the problem. The Committee believes it would require an annual budget of \$25 million to carry out this work speedily and adequately.

"The Committee also recommends that the Department continually keep before the public the facts regarding the threats that exist for fish and wildlife resources. The Committee believes that this is one of the most important resource management problems that exists today."

This Committee is made up of 24 individuals, of whom two-thirds are identified with national conservation groups and one-third with commercial fishery associations.

With recognition on the part of the Congress of the urgent importance of obtaining as quickly as practicable essential knowledge of chronic toxicity and of the possession of such information before mass spraying projects are seriously considered or undertaken, it would seem that expenditure of 25 million dollars per annum on such a program would represent minimum wise and prudent cost, and that all bills heretofore introduced in Congress with relation to this matter should be drastically revised upwards as regards authorized expenditures. Relatively, 25 million dollars is not an exorbitant sum for research, in view of the fact that at least 260 million were spent on pesticides in 1956. Many industries allot five to ten per cent of their working budgets for research. We should not delay further the fact finding necessary for protection of human health, and the protection and perpetuation of our wildlife resources.

## Need of Greater Wintering Range for the Whooping Crane

One of the extraordinary characteristics of the whooping crane is that it defends its wintering territory as most birds do their summer breeding territories. In fact, it has been demonstrated again and again that, on their wintering grounds on the Aransas National Wildlife Refuge in Texas, a family pair will protect an area in winter of some 500 to 1,000 acres. By protection we mean that, if one of their own species encroaches on that protected territory, it will be driven off. You can see at once that this greatly restricts the carrying capacity of the winter range; so much so that when the cranes brought back eight wild young in 1955, the wintering territory on the Aransas National Wildlife Refuge was not sufficient, and they overflowed onto neighboring lands.

Recognizing this situation, the federal government desires to extend the refuge area for the wintering whooping cranes in Texas, and Congressman Young of Corpus Christi, with the collaboration of the Fish and Wildlife Service of the U. S. Department of the Interior, and your Society, introduced a bill which would provide opportunity for the federal government to acquire such additional whooping crane wintering grounds, and incorporate them with the Aransas National Wildlife Refuge in the Whooping Crane National Wildlife Sanctuary.

At the same time Congressman Young has provided, through additional content of the bill, for contemporaneous protection of adjacent spawning grounds of many kinds of valuable fish; valuable both for sport and commercially.

At the last session of Congress, during which Congressman Young introduced H.R. 9353, Senator Yarborough of Texas introduced S. 2886 which, with minor difference, is a companion bill. These bills have status at the existing session of Congress.

On December 9 last, your President testified at a hearing in Corpus Christi, Texas on H.R. 9353. The meeting was attended by many persons, including representatives of the Regional Office of the U. S. Fish and Wildlife Service, the manager of the Aransas National Wildlife Refuge, and representative of its Fisheries Divi-

sion, as well as representatives of the Wildlife Management Institute and individuals resident in Corpus Christi. At the meeting, there was only one opponent to this proposed legislation. He was a representative of the Sportsmen's Clubs of Texas, who said that the lands presumably involved were owned by people who are conservationists of the first water, and that these private landowners may be counted upon to protect the whooping cranes on their lands more effectively than would the federal government. This may be so but ownership of refuge lands by the federal government is far greater assurance of permanency. No one can be certain what the future attitude may be of the private owners of these lands.

The two bills have been referred to the Committee on Merchant Marine and Fisheries of the House, and to that on Interstate and Foreign Commerce of the Senate. In our opinion, it is in the interest of conservation, and especially of the whooping cranes, that these bills be enacted, and we hope that you may express your opinion with regard to them to your own Senators and Congressmen.

The whooping crane is symbolic of the threat to vanishing species. It is of greatest importance to conservation that every step within reason be taken to assure its permanence as a member of the living wildlife community.

—THE END

## SOME SUGGESTIONS FOR NEEDED RESEARCH

By Harold S. Peters

*Technical Adviser to the National Audubon Society, formerly of U. S. Bureau of Entomology, and formerly Research Biologist, U. S. Fish and Wildlife Service.*

Pesticides are used as sprays, dusts, aerosols or fogs. Some are applied in granular form. Carriers of various types are used to disseminate the chemical—an oil emulsion, neutral earth, clay, or similar material. The carrier itself may prove toxic to various organisms, or may cause irritation when inhaled (as a dust).

The newer insecticides, particularly the chlorinated hydrocarbons (DDT, chlordane, dieldrin, heptachlor, etc.) may cause contamination of our drinking water and foods—milk, vegetables, fruits, and other foodstuffs. They persist for several years in soils and for lesser periods in water. Consequently the microorganisms in the soil, from bacteria and fungi, to worms, insect larvae, crustacea, and small mammals, may be affected severely or eliminated to a varying degree. Many of these soil fauna are necessary for proper aeration of the soil and its continued fertility.

In planning research on the effects of such pesticides on soil animals

and other wildlife it is necessary to know the populations present *before* any applications—both in numbers of individuals and species. Immediate effects of the application of chemicals should be observed as should the cumulative or long term effects. This may entail observations for a period of one year before chemical treatment and during an adequate number of years afterward. Investigators who are familiar with the ecology of the area concerned as well as being capable of correct field and/or laboratory identification, should be employed for the work. Test plots, or areas, should be clearly marked and easily accessible. Various soil types, ecological habitats, and typical areas should be included in the study areas. These should be replicated (duplicated in series) and some should remain untreated as "controls."

With particular reference to the present operations for control of the imported fire ant, said to be distributed at this time over 30,000,000 acres in nine southeastern states, the research needs can be more specific. First are needed careful life history studies of the fire ant itself, as well as an investigation of the relation-

ships with the so-called "native" fire ants, and other species of ants in the Southeast.

The chemicals presently employed for fire ant control (heptachlor and dieldrin) are reputed to act mainly as contact poisons. They are being distributed in granular form by airplane at the rate of two pounds of the active chemical per acre; in practice, granules of 10 per cent strength are covered with clay and applied at 20 pounds per acre. Various rates of application should be tested not only for control of the ants but also for their destructive effects on wildlife, livestock, and man.

Careful studies of selected areas within the range of the fire ant should be chosen for investigation. Indicator species of wildlife, both birds and mammals, should be chosen for study—such as woodcock, quail, dove, robin, meadowlark, skunk, raccoon, and squirrel (also selected amphibians and reptiles). Time, money, and personnel are required. The scope of this work, and the immediacy of the need necessitates federal financing and responsibility, no matter to what degree private organizations cooperate.

—THE END



# WOODPECKERS—

## Carpenters for Other Birds

By E. J. Sawyer

Illustration by the author.

THAT it is typical of woodpeckers to excavate their own nesting chambers in the trunks or large branches of trees is, of course, well known. This general statement, however, covers only a part of the subject, and far from the most remarkable part, for these birds are carpenters not only for themselves, but, however unwittingly, for a host of other birds.

Before going further into the subject, we might briefly consider a certain much neglected but notable architectural feature of these chambers. From my observations it would seem these birds are all somehow aware of a certain principle of mechanics which, among humans, is not generally appreciated, although it is familiar to engineers: *The highly exceptional strength of the "tube."*

The nesting excavations made by woodpeckers are essentially tubes. Hardly less remarkable is the judgment they apparently use in gauging the thickness of the tube's walls with relation to the strains they must bear. I have seen small, dead trunks that downy woodpeckers had hollowed out to within half an inch of the bark all around, so that a severe shake could break them in two. Yet never have I found an instance in which nature had caused such a break while a woodpecker was actually nesting. Yet it is not uncommon to see a stub that had broken across a downy's abandoned nest chamber, leaving the bottom of the excavation a wide-open bowl. In

these cases it may be supposed that the breaking occurred months or years after the nestings, due to further rotting of the wood.

Half or more of a tree's weight and bulk may be above the woodpecker's excavation; this is not at all unusual. So the weight to be supported by the walls of the chamber may be several hundred pounds or a ton or more. In such cases the thickness of the walls varies from one inch to more than four inches.

In three distinct ways these woodpecker "carpenters" are especially fitted for their work. All species have sharp, straight, and slender bills, chisel-pointed in the typical mem-

bers of the family. In all species the central feathers of the tail are peculiarly stiffened and bristle-tipped to support the bird's weight when pressed against a tree trunk or other upright surface in familiar woodpecker fashion. In all but one group, known as the three-toed woodpeckers, the toes are arranged two in front and two behind. The claws of all species are sharp, well curved and stout.

It is true that chickadees and nuthatches often do their own excavating, in which cases their work is much like that of a woodpecker. But they require the rotting wood of dead trees or stumps. Woodpeckers alone are capable of drilling in sound, or fairly sound, wood. It is interesting, though possibly futile, to speculate as to when and how bluebirds, sparrow hawks, small owls, crested flycatchers, wrens, and other hole-nesting birds came to adopt these second-hand homes. At least we can be sure their choice, or adaptation, was a "wise" one, for these burrows provide maximum safety from animals that might destroy them, and shelter from storms.

The woodpeckers drill their nesting holes according to a uniform pattern. The size of the doorway is always a close fit, thus automatically excluding all birds and other animals larger than themselves. From the great ivory-billed woodpecker to the small downy, they range in size from 20 to less than 7 inches in length; that is to say, from crow-size to sparrow-size. Not only the size and shape of the entrance, but all other proportions of the nesting chambers conform to the size of the builder. The cavity, circular throughout in cross-section, is as a rule roughly half the length of the bird in width; its depth is about one and a half times the builder's length.

*Continued on page 89*

### About the Author

Edmund Joseph Sawyer, artist, naturalist, and author, will be known to many of the readers of *Audubon Magazine*. He has had more than 700 articles and several books published, and his articles have appeared in *Country Life in America*, *St. Nicholas Magazine*, *Bird-Lore* (the predecessor of *Audubon Magazine*), *Nature Magazine*, and others. He is known well for his illustrations, especially of birds, and information about his career has appeared in "American Men of Science," "Who's Who in American Art," and "Who's Who on the Pacific Coast."

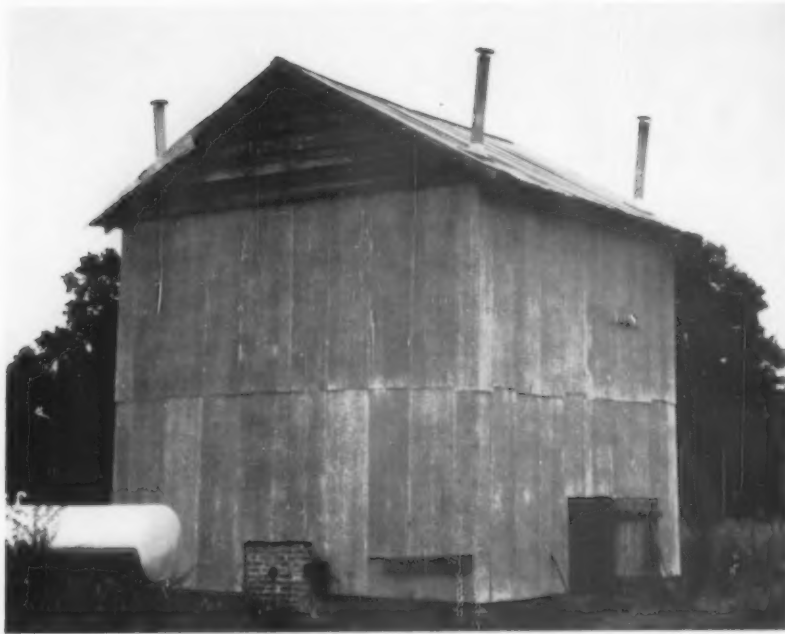
Mr. Sawyer painted the first of the National Audubon Society's series of colored plates of birds (the robin) and about 12 of those that followed. Now, almost 80 years of age, Mr. Sawyer has written us that one of the greatest compliments paid him has been the title, "Dean of American Bird Artists." — The Editor

← A downy woodpecker (center) at its nesting hole, with some prospective bird tenants around it. They are, starting at the top and reading clockwise to the right, tufted titmouse, red-breasted nuthatch, white-breasted nuthatch, house wren, and black-capped chickadee.

# OIL

**Bluebirds, seeking a roosting or nesting place, are fatally attracted to tobacco barns in the Southeast.**

**By Luther Partin**



Without a protective screen around the smokestacks, birds that nest in holes and crevices enter them, fall down the narrow smoke pipe, and are trapped below.

*All photographs by the author*

Birds can still survive their fall down the stack to the unlit burner, provided the top of the burner is left off, or the joint of the pipe next to the burner is removed after the tobacco curing season is over.



THE modern oil-burning tobacco curer is a wonderful thing for the farmer—but there is growing evidence that it is needlessly killing countless thousands of songbirds in North Carolina every year.

There is a type of oil burner on the market to suit every taste. All of them do a good job if used properly. From the standpoint of their effect on birds, oil burners can be divided into two groups: those having a flue or smokestack extending up through the roof; and those not having a smokestack.

This article will be concerned with the first group. Not because they're better or worse than the burners without smokestacks, but because the burners with smokestacks sticking up above the roof can destroy a large part of our songbird population. We say, "can destroy," because the situation can be controlled. Burners with smokestacks can be made as safe, from the bird's point of view, as any other type of burner.

It's a fact that songbirds get in the smokestacks. Whether they're looking for shelter, a nesting place, get in accidentally or because of curiosity, or whether they've just been watching Santa Claus, no one has yet been able to prove. Once inside, a bird can go but one way—down—since the pipe is too small for flying. The trip downward into the burner probably doesn't hurt a bird seriously, as it can use its wings enough to slow the fall. But it would be better off if the fall killed it, unless starvation can be considered a more merciful death. And that's about all that can happen to a bird inside a closed burner, without food or water. Its mummified remains will be found by a farmer cleaning out his burners in preparation for the coming curing season.

Reprinted from "Wildlife in North Carolina," January 1955 issue, with permission of the editor.

# BURNERS AND BLUEBIRDS

Judging from the numerous letters received by the state museum authorities and the North Carolina Wildlife Resources Commission, the number of birds trapped in oil burners each year is worth considering. The death of these birds is regrettable, not only from the standpoint of their song and beauty, but from the standpoint of their insect-destroying activities, as well.

And now let's have a remedy. The simplest way to prevent birds from being trapped is to leave burner doors open after the curing season. If any birds get in the smokestacks they can fly out the burner door without harm. But some burners don't have doors; they have removable tops, instead. With these, the tops can be left off between curing seasons, or, better yet, the joint of pipe next to the burner can be removed. Birds coming down the pipe find themselves in a barn instead of trapped in a burner. Getting out of the barn is no problem, even to the largest songbird. Most barns have an opening in the gable for ventilation, and there is almost always an open space between the rafters and the plate. The ease with which birds can go in and out of tobacco barns is evidenced by the large numbers of birds that roost in tobacco barns during the winter.

A simple preventive measure when building a new barn, or installing burners in an old barn for the first time, is to fasten a small piece of hardware cloth around the bonnet on top of the smokestack. About 1/2 inch mesh is fine. Or, if you don't use bonnets, make a cap out of hardware cloth. Shape it like a big ice cream cone, or a funnel, and fasten it over the top of the smokestack. Of course, these measures can be applied to old barns, but it's a lot more trouble than leaving a burner door open or removing a section of pipe in the barn.

To get some idea of the number of birds being trapped and to obtain information and illustrations for this article, the North Carolina Wildlife Resources Commission conducted a spot survey of tobacco barns. This writer, armed with flashlight, camera, tripod, flashbulbs,

wrenches, screwdrivers, and pliers, examined several dozen tobacco barns in the Bright Leaf Belt. The findings were amazing, to put it mildly.

The first burner in the first barn checked had three dead sparrows. None of the other three burners in the barn had any. And so it went. The birds were usually concentrated in one or two burners in a barn. They obviously were not advocates of segregation, as bluebirds, sparrows, wrens, and starlings were all found sharing the same final resting-place.

The largest single find was a mixture of nine sparrows, starlings, and

bluebirds in one burner. Another burner in the same barn had five birds. A third had two; a fourth burner was empty. A total of 16 dead birds in one barn. Two other barns with smokestacks on that particular farm yielded three more dead birds; a total of 19 on one farm. That was much higher than the average for the survey, of course. It wouldn't take long to decrease materially the songbird population at that rate. There were many barns and many farms that had no trapped birds at all. Significantly, most of these were cases where the doors to the oil burners had been left open.

One happy note of the survey was

**Two bluebirds, two starlings, and five house sparrows died when they were trapped within one burner.**





A small sum spent for a little hardware cloth screening, and placing it around each stack, may save the lives of thousands of birds.

the discovery of an English sparrow still alive in a burner. Very weak, but evidently determined to face the end and with typical ornithological bravery, he was standing courageously among several of his fallen comrades when the door was opened. He was kind enough to pose for several pictures, after preening his feathers a bit and apologizing for his bedraggled appearance. But the flashlight and exploding flashbulbs must have been too much for him. After a few pictures, he mustered his strength, pecked the photographer's hand, and flew out the open burner door, and up and out the gable ventilator to freedom.

Very few farmers could remember finding birds in their burners in previous years, in spite of the birds that were found during the survey. Yet, there is a possibility that many birds are trapped in burners, unknown to the farmer who cleans them out. In several instances where farmers had not discovered birds in the past, a small son or daughter remarked that they had gotten dead birds out of the burners while playing in the tobacco barns. In practically every case where children had taken birds out of the burners, the parents knew nothing about it. It would be difficult to estimate just how many trapped birds go unnoticed by adults in this manner.

Every farmer was quick to say he

would leave his burners safe for birds at the end of this curing season. As one fox-hunting farmer put it, "Just one little bird killed that way is too many. They're worth a little effort to protect 'em just to have them around to look at and listen to, besides helping to keep the bugs and worms from eating up the crops." One farmer ventured the following, "The reason tobacco worms and boll weevils are getting worse every year is because there's not so many birds as there used to be. Maybe this is what's happening to 'em."

There are several hundred thousand tobacco barns in North Carolina. The survey average was about one bird for each barn checked. Figure it for yourself. If this even remotely resembles the true situation, a staggering number of birds are killed each year in this manner.

It takes but a little effort to make sure all the burner doors are left open after curing the last barn of tobacco. Or to remove the section of pipe next to the burner, if it has no door, or to bird-proof any new smokestacks you install. Do it this year. You can save many birds that will thrill you with their music and flashing colors, and, if the farmer was right, you'll be cutting down on the amount of insect dust and spray you'll have to buy in the future.

— THE END

#### THE WOLVERINE—Continued from page 67

dog, snowshoes, rifle, and even his match box, has been told and retold a dozen times in magazines, adding and readding to the wolverine's bad name. And as for its "sheer love of vandalism" or "harboring a grudge against all humanity" so often quoted, this is ascribing human emotions to the animal. Even so, I think it is well to remember there are rogues among elephants, hippos, squirrels, and many other species not excluding man, but small in proportion to their total population.

"I never saw an animal with such temper and hate; if he could have reached me he would have torn me to shreds," says one author of "thrilling" adventure. But in the opinion of several outstanding mammalogists, notably T. Donald Carter of the American Museum of Natural History, New York City, the evidence available shows that the traditional readiness of wolverines to attack human beings is sheerest bunk. And here again Judge Fry's experience is worth repeating.

One female he caught digging marmots from an embankment sprang, at his approach, on top of a log, uttered a guttural snarl (their only known cry) and showed her teeth. As though searching for any sign of hostility she focused her bead-like eyes on his, raised her nose to sniff for any unusual scent, pricked her ears to catch any unusual sound. Finding none she scratched her claws on the log as though preparing for combat. After maintaining her inquisitive attitude fully five minutes, she slowly advanced along the log to within 15 feet of the ranger; she stopped only when she seemed satisfied the intruder meant her no harm. Then she backed away, turned, and without looking back, disappeared among the trees.

But on one point scientists, trappers, and Indians all agree: it's as safe to enter the den of a mother grizzly as to face a mother wolverine with her young. She is a tigress in her ferocity, so fearless, resolute, strong, and savage that even an armed hunter takes a great risk upon approaching her. Says Seton: "A mother bear may attack, a mother wolverine certainly will." She will fight to the end, never yielding an inch. And while the last spark of life remains she is a raging fury.

Her home may be a shelving rock, burrow, hollow tree, or merely a rude excavation in the snow beneath a fallen tree. Here, in early summer, two to four babies are born. They are lighter colored and more prepossessing than their parents, and delightfully playful. Suckled for eight weeks they remain home till late in the summer when their training in the hunt and mischiefmaking begins. The male isn't much help in parental care; that is the female's job, and the bitterest critics of wolverines admit that, in the affection she bestows on her young, she deserves the highest marks.

Just as the ferocity of the wolverine has been exaggerated, so has its alleged "insatiable" appetite.

Two European wolverines in the Bronx Zoo, in good health now for five years, thrive on a daily ration of three pounds of meat, two fish, and a pound of dogfood. In the University of Michigan, a wolverine lived for two years on a daily ration of 1,200 calories. And one mentioned by John James Audubon—a gentle, affectionate pet trained to sit up holding a German pipe in its teeth—consumed no more food than a dog. According to Seton there is positive testimony that the wolverine is not especially gluttonous, and that in the wilds one good square meal a week is probably its regular diet. Little wonder, then, that if chance provides a banquet that it dines greedily. So does my lovely Siberian husky—daily, not weekly.

Whatever the truth about wolverines they seem to be doomed. Their fur has no great commercial value; only Eskimos prize it because, when used on their parkas, the guard hairs will not collect frost. Thus mid-lady's fashions, for once, may not be blamed for exterminating a species. But so long as every hunter, trapper, and farmer believes they are so obnoxious they should be destroyed by any means, foul or fair, even stricter game laws will not be enough to save them. I wonder if any other inhabitants of the northern solitudes have so vividly excited the imagination of their biographers. Because wolverines, or "gluttons," have become an evil legend, a sort of modern werewolf hated by men and animals alike, it is a wonder that they didn't disappear long long ago.

—THE END

## HOW IT GOT ITS NAME

robin



*Illustration by Walter Ferguson.*

**By Webb B. Garrison**

COUNTRY folk of early Normandy referred to any gay blade as "Robert." Eventually the name was abbreviated to Robin and used in many ways. Among others, it was the jocular title of a youth in love. Conquerors took the name with them when they invaded Britain in the eleventh century.

Many persons of the island noticed that a common bird was almost human in its love-making—even choosing a special bit of territory and defending it against rival males. It was logical to give such a feathered

swain the name of a giddy adolescent and call him "the red-breasted Robin." Abbreviated in popular speech, the name of the bird became *robin*.

Wherever English colonists have gone, they have taken the bird-name with them. Failing to find the common European robin red-breast in America, they gave its name to the larger, red-breasted thrush, or American robin. In other parts of the world, the name has been given to birds that have nothing in common with the English robin, except small size and reddish feathers on the breast.

—THE END

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## Attracting Birds



## Help For A "Widower"

By Mrs. Clary Clover,  
Muskegon, Michigan

WE HAVE a large maple tree in the backyard, close to our house. In it, we have built a bird feeder with a roof and three sides. We keep it, as well as many other feeding stations, filled with suet cakes, peanut butter, and lots of sunflower seeds. Every spring and summer for about three years, we had what we believed was the same mother robin select this particular feeding station for the nursery. She came back faithfully each year and reared her little family.

One year she arrived, and, after a period of nest-building and preparation, she laid her eggs. We knew when the eggs had hatched, as immediately, she began to make frequent trips to and from the nest with the aid of her gallant mate, a bird which later proved to be an extraordinary father.

Whenever we knew there was a nest close to the house, we watched it very closely, as many birds were killed along the highway in front of our home. Late one afternoon, a few days after the birds were born, we noticed the over-long absence of the mother robin. We saw the father arrive infrequently with food for his offspring, but no mother. As the sun set and it began to get dark we knew that something must have happened to the mother robin. A few days later we found her where she had been killed by a passing motorist.

After the father robin had made his last trip for the day, we covered the nest with a heavy wool sock. The nights in Michigan can be very cool, and this particular July, was no exception. The nest was within arm's reach, so we could feel the smooth skin of the baby birds as we covered them. We decided to get up at dawn, so we could uncover the babies before the father robin arrived. At 4:30 a.m. my husband and I went out. It was a very cool morning and very beautiful. I don't think there is anything more beautiful than a chorus

of birds at daybreak. The woods surrounding our home seemed to come alive with sound.

We waited under the tree, not wanting to remove the sock until the last possible moment when the male robin arrived. Suddenly, there was a flutter of leaves, as he alighted on the branch above us. He didn't realize we were there at first, and when he saw us, he started, and flew to a neighboring tree. We quickly removed the sock and retreated to the back of the house to watch. The robin flew down immediately, inspected his family, and then flew away. He was back shortly with food. The babies responded to his feedings for a short while as he flew to and from the nest. Gradually the cold penetrated their little bodies. In between visits to the nest, the male sat in a high tree next to the house and called to his mate. All the first week he did this, off and on, from dawn till dusk. He realized she was gone, or so it seemed.

On the first morning, we didn't know if we dared touch the nest any more than we already had. Finally as the day progressed, we noticed that the father robin was getting no response from the youngsters when he arrived with earthworms. The babies were evidently dead from the cold or close to it, so we took matters into our own hands and decided to help. We lifted the nest down and removed the three youngsters. One was already dead and the other two were icy cold. My husband took one and I took the other and we held them in our hands until their skin felt warm. They began to wiggle and to cheep faintly. Surprisingly, the father robin waited in the nearby tree, silent and watching. My husband had a pocket-warmer\* which he used when he went

\*The Pocket Hand Warmer, which may be bought at hardware or sporting goods stores, is used by farmers, sportsmen, football fans, and other people who are often out-of-doors in winter. The author has written us that the one owned by her husband is a 3 1/2 x 2 1/2 inch flat metal case which encloses a small platinum asbestos burner and cotton saturated with gasoline, benzene, alcohol or cigarette-lighter fluid as fuel. "any of which supplies 12 to 24 hours of heat. . . . It never gets hot, just pleasantly warm." — The Editor

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ice-fishing, and we suddenly had the idea of using it under the nest. We tore out a section of the nest bottom, and inserted the warmer in the feeder house, directly under the nest and put the babies back. The heat of the warmer soon reached the little naked bodies, and the babies moved and stretched. We stepped back to watch as the father flew down and hovered over the nest. He turned his head first one way and then the other as though inspecting them thoroughly. He seemed to be satisfied, and flew away, soon to return with a limp earthworm. They were hard to find that year, as we had had no rain for a long period of time, so again we decided to come to his aid and supply the worms. My husband dug enough during the next few weeks to furnish an army of fishermen. The army turned out to be two small hungry robins. We had no idea they could consume so many!

It didn't take the male robin long to realize that we were on his side. He selected an area near the tree in which he did all his singing and calling of his mate. We put little groups of earthworms on the driveway within sight of the tree and after the robin's first few trips down to pick them up (he showed some hesitation at first), he was soon waiting patiently in the tree for the handouts.

It's a wonder the young robins did not die from overfeeding, because the adult robin took every earthworm to the nest. Sometimes when we put too large a pile of them down, he was actually top heavy and could hardly get off the ground. We deliberately slowed down the handouts, because it got so that he sat in the tree and just waited for us to supply the worms. We don't know if the food caused the birds to grow so fast, or if it was normal, but we could see a great change in their growth from day to day. As the sun set each day, we would take the nest into the house for the night, refill the pocket-warmer, and sit and study the homely, but sweet, featherless little babies. They were well-filled, they were warm and content. Their eyes were not yet opened and as long as they couldn't see, they were unafraid. Each morning we took the nest outside at dawn and the male robin was either there at the same time, or would arrive shortly. He knew us and trusted us.

In exactly five days, the robins had long pin-feathers on their wings and along their spines. Their feathers seemed to grow about 1/2-inch a day. In about a week their eyes opened, and then, for the first time, they began to show fear of us when we brought them into the house in the evening. Their gaze would follow us around as we moved through the room, but they hid,

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dled together, and decided to make the best of it. They refused to take any more food from us, once they could see us, and they acted like two very stubborn children.

After that we decided to leave the young robins out at night. They were well-feathered and the tree and the shelter of the feeder where the nest had been built, protected them from the moist night air. It was getting more and more difficult to find earthworms, so my husband went farther into the woods to dig. He did more digging that summer than he had ever done before, or has done since.

On the 12th day, the robins left the nest, encouraged by the father. We thought they were much too young and wobbly, but he surely knew best. We felt they really needed a mother's guidance for this important step. They couldn't fly at all, so they hopped and staggered over the ground toward the woods, their father just ahead of them, guiding them by his voice. We watched carefully, and it was amazing to us how he did it. They hopped in the direction of his calls with great confidence. As they disappeared into the woods, we wondered if we would ever see them again; if they would be safe on the ground as they seemed so small and defenseless. We thought we wouldn't see the father robin either, but the very next day and every day after that, he continued to come to the tall tree and call to us. We tossed earthworms on the ground, and away he went with them, so we knew that the young ones were probably all right.

Exactly two weeks later, we saw the father robin under the same tree that held the nest, and with him were the two, full-size young robins. We saw the three together frequently after that. We don't know what happened to them after that summer. We have had a lot of robins nesting around here but never in that same tree. The tall tree blew down that following winter. We often wonder as we see robins in the yard if they could be our male of that year, and his offspring. We often wonder, but we shall never be sure. —THE END.

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# WOODPECKERS — CARPENTERS FOR OTHER BIRDS—

Continued from page 81

Thus it will be seen that other birds, from ducks and owls to chickadees and wrens, are provided with quarters which they can adopt, according to their size.

As to furnishings in the hollow tree homes, the owls and sparrow hawks are satisfied to take them as they find them—bare of any lining or bedding other than the layer of soft wood chips left by the woodpeckers. The bedding provided by others is of twigs, straw, bark, hair, feathers, and the other usual materials of outside nests.

That birds may prefer a cylindrical, rather than a rectangular cham-

ber was demonstrated for me most convincingly by a certain red-breasted nuthatch. Having carefully designed a rustic type house expressly for this species, I sought out a promising-looking old, dead stump and on its top fastened the supposedly irresistible home. After a few weeks I went to investigate. Pounding on the base of the stub promptly brought a red-breasted nuthatch from a hole which the bird had preferred to make for herself only a foot below my own handiwork. There can be no doubt that my offering had first been thoroughly inspected inside and out before the bird decided against it. A circular interior, even in rotten wood and at the expense of days of work was preferred, rather than a rectangular house of sound wood.

Numbering about 90 species and subspecies and ranging from Florida to Alaska, inclusive, and from coast to coast, the woodpeckers are indeed far-flung. There is no considerable area in the United States or the Canadian provinces, in which bird-life of any kind occurs, without woodpeckers. By the same token, no species of bird disposed to utilize a woodpecker hole is without these local carpenters to provide for its needs. In forested areas, trees of every kind, both deciduous and coniferous, are used. In our southern deserts various woodpeckers nest exclusively in saguaro cactus and other tree-like cacti. These excavations are in due time made use of by various bird species of those areas.

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Continued on page 94

## Actual photograph of hummingbirds at feeder



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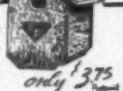
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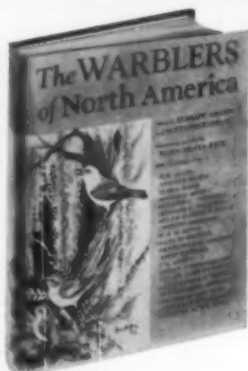
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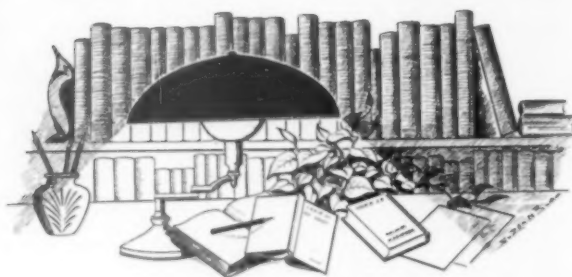
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## BOOK NOTES



By **Amy Clampitt**, Librarian, Audubon House

### NATURE AND THE AMERICAN:

#### Three Centuries of Changing Attitudes

By **Hans Huth**, University of California Press, Berkeley and Los Angeles, Calif., 1957. 10½ x 7 in., 250 pp. Illustrated. Indexed. \$7.50.

For readers of *Audubon Magazine* the chief value of Mr. Huth's thoughtful study may be the fact that it places the conservation movement in what might be termed its philosophical perspective. In a sense the book is a history of conservation, though in fact its stated province is a good deal broader. The philosophical and religious context of the Seventeenth Century, which saw in nature (to use the words of the poet Michael Wigglesworth) "waste and howling wilderness," and the ethical one, typified by the stern Puritan doctrine that "what is not useful is vicious," about which Mr. Huth writes at some length in his opening chapter, shed light on the romantic reaction that followed (which Audubon typified and which paved the way for the conservation movement) and on certain attitudes which continue to persist—such as the one which divides hawks into "good" and "bad," or the one implicit in the Echo Park Dam controversy. The familiar figures are all here—the Bartrams, Thoreau, John Muir, Frederick Law Olmsted and Theodore Roosevelt, to name a few. It is interesting and perhaps surprising to find Jonathan Edwards, William Penn, and James Fenimore Cooper mentioned as forbears of a distinctly New-World concern over wildlife; or, among later leaders, the artist George Catlin, who was perhaps the first man to advocate the idea of a national park, and George Marsh, whose "Man and Nature," published more than three-quarters of a century ago, urged the same far-sighted approach that was totally new to so many who first encountered it in the writings of Aldo Leopold. The volume has been

tastefully designed and is beautifully printed; the text has been extensively annotated, and there is a selective bibliography. Mr. Huth is Curator of Research at the Art Institute of Chicago, an active mountaineer, and a charter member of the National Trust for Historic Preservation.

### THE ECOLOGY OF MAN

By **Paul B. Sears**, University of Oregon Press, Eugene, Oregon, 1957 (*Condon Lectures*). 10 x 6½ in., 61 pp. Illustrated. \$1.00.

The Condon Lectures, named in honor of the first professor of geology at the University of Oregon, have as their purpose "to interpret the results of significant scientific research to the nonspecialist." Happily they have been made available in printed form, and they constitute a brilliant series by some of the most distinguished of our men of science. Here Dr. Sears, who is the Chairman of the National Audubon Society's Board of Directors, gives an exposition of the young science of ecology and its moral (that is, its human) implications, which is as terse, eloquent, and at the same time good-natured as it is profoundly learned. Indeed, a more satisfactory statement of the concerns of our own Society, in their broadest sense, would be difficult to find.

### THE ANTS

By **Wilhelm Goetsch**, University of Michigan Press, Ann Arbor, 1957. 8½ x 5 in., 169 pp. Illustrated. \$4.50.

Engagingly written, extensively illustrated, handsomely designed, and beautifully printed, this book by a distinguished European entomologist is just about everything a specialist's book for the non-specialist ought to be. In lively and authoritative fashion it disposes of several widely held but incorrect notions. One of these is that ants drive the aphids with whose

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colonies certain species associate out to pasture like cows: actually, though the ants do "milk" them, the aphids are a little more free-wheeling than that. Another such notion is that which distinguishes *Homo sapiens* as the sole tool-user in the animal kingdom: the fact being that he must share this accomplishment not only with the apes but also with the weaver ant, which uses its own larva as a shuttle for stitching together leaves to make a nest. On the much-debated question of the ant's intelligence—Mark Twain irritably pronounced it the stupidest of animals—Dr. Goetsch sheds the light of some fascinating experiments, which prove pretty conclusively that while ants can hardly be said to reason, they *can* learn a thing or two. It is clear that, unlike another detractor who referred to their kind as "those crashing bores," this author likes ants, and his affection is contagious. There is one complaint to be made: the book has no index.

#### USING WAYSIDE PLANTS

By Nelson Coon, published by the author at Watertown, Massachusetts, 1957. 8 1/4 x 5 3/8 in., 254 pp. \$3.00.

The varied lore contained in this informal compendium is either useful or curious, or both, depending on the reader's point of view, but in any case it is full of pungent charm. Anyone fortunate enough to have enjoyed a country childhood will most probably find himself transported forthwith into that forgotten era of nut-gathering, clover-chains, and dandelions held under the chin to the formula, "Do you like butter?" The last-named plant, quite suitably, figures more prominently here than any other. Everybody has heard of dandelion wine: who, now, knows how to make it? Well, the recipe for it is here, in two versions, along with those for such improbable items as nettle soup, cattail-pollen pancakes, and clover-bloom vinegar. Here, also, is a discussion of the medicinal qualities of plants; yet another chapter tells in detail how to make and use plant dyes. By profession a librarian, with training as a florist, Mr. Coon is also conservation-minded, and his book should give pleasure to anyone who enjoys a ramble along a country road. Quite suitably, he has published and distributed, as well as partly illustrated it himself, and one cannot but suppose that he has had fun out of the entire operation.

#### SOIL:

##### The 1957 Yearbook of Agriculture

U.S. Government Printing Office, Washington, D. C., 1957. 9 1/4 x 5 7/8 in., 784 pp. Illustrated. Indexed. \$2.25.

"Soils and Men," the Department of Agriculture Yearbook for 1958, con-

tained the following stern warning: "The social lesson of soil waste is that no man has the right to destroy soil even if he does own it in fee simple. The soil requires a duty of man which we have been slow to recognize." Now, 20 years later, comes this volume whose stated purpose is "to indicate the extent to which that warning has been heeded—and at times to repeat it—and to describe the knowledge about soils that scientists and farmers have since gained." Leaving the larger subject of land use for a future volume, this one is devoted entirely to soil in itself. Particular topics covered include, among many others, toxic elements in soils, composts, stabilizing sand dunes, soil maps, soil management for orchards, and shelterbelts and windbreaks. There is a useful glossary, and like its predecessors the volume is attractively designed and sturdily bound—a real bargain in reference books.

#### JOHN KIERAN'S TREASURY OF GREAT NATURE WRITING

Edited with comments and biographical notes by John Kieran, Hanover House, Garden City, N. Y., 1957. 8 1/2 x 5 3/8 in., 640 pp. \$4.95.

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### NO ROOM FOR WILD ANIMALS

By Bernhard Grzimek, W. W. Norton, New York, 1957. 8 3/8 x 5 1/2 in., 271 pp. Illustrated. \$3.95.

Here the director of the Frankfurt Zoo tells of the pleasures and tribulations of an expedition to the Belgian Congo which brought back an okapi and a baby elephant. The author includes a brief history of the Congo region, together with a good many peppy comments on big-game hunters and internal-combustion engines, among other things. One of the most interesting chapters concerns those charming forest people, the pygmies, who, Dr. Grzimek predicts, through intermarriage and loss of habitat will one day be extinct. The threat of extinction now faced by the wild animals of Africa as a result of the rapid development and exploitation of that continent is indeed his prime and passionate concern, and on this score alone his book merits a recommendation.

### A PADDLING OF DUCKS

By Dillon Ripley, Harcourt, Brace and Company, New York, 1957. 9 1/2 x 6 in., 256 pp. Illustrated. \$6.00.

For Dr. Ripley, waterfowl are clearly the most wonderful things in the world, and the Connecticut pond where he began raising them while he was still a schoolboy, hardly less than the center of the universe. Here he tells of the triumphs, the setbacks and the adventures

of an avicultural career which has involved some hobnobbing with maharajahs as well as coping with such things as hurricanes and great horned owls (to which latter, unhappily, he refers as "vermin") nearer home. Anyone who shares his enthusiasm will find the whole thing, including the illustrations by Francis Lee Jaques, delightful.

### OBSERVATIONS ON BIRDS OF SOUTHEASTERN BRAZIL

By Margaret H. Mitchell, University of Toronto Press, Toronto, Ontario, Canada, 1957. 10 1/4 x 6 3/4 in., 258 pp. Illustrated. Indexed. Paper \$4.50, cloth \$5.50.

From 1950 to 1954 the author, an amateur ornithologist who has previously published a study of the passenger pigeon in Ontario, was living in Rio de Janeiro. This record of her observations during that time consists of an annotated systematic listing of the 289 species of birds which she was able to identify positively, with an introductory chapter describing the localities she visited. In view of the relative scarcity of material in English or, indeed, any language, on the numerous and fascinating birdlife of this vast country, such a study is certain of a welcome. Mrs. Mitchell writes with a pleasing informality, and while it is, of course, not intended as a field guide, any bird-minded visitor to Brazil will find her book helpful. The distinguished Brazilian ornithologist Oliverio Pinto has written a brief foreword, and there are maps, photographs, and a bibliography.

### JUNIOR BOOKS

#### BRUSH GOAT, MILK GOAT (8-12)

By Ruth Thomas, Sterling Publishing Company, New York, 1957. 8 x 5 1/2 in., 127 pp. Illustrated. \$2.50.

How a doe kid born in an Arkansas snowstorm grew up to be a stubborn nanny-goat who was gentle with children but refused to be milked, until a little boy on crutches came along, and how she was handed from owner to owner until she ended up where she started, is the story this appealing and authentic book has to tell. Emily, the heroine, has all the individuality that an animal which has been petted in the first stages of its life generally acquires, the successive owners are real country people, both old and new style, and, since the author knows whereof she writes, the "feel" of their everyday life, with its texture of problems and pleasures, is present throughout. Any child who loves animals and yearns to live on a farm will love Emily, and having read her story will probably want a goat of his own.

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By Katherine and John Bakeless, Lip-pincott, Philadelphia and New York, 1957. 8 1/2 x 5 5/8 in., 222 pp. Illustrated. Indexed. \$3.95.

A vivid and absorbing account of the exploration of the North American continent, beginning with the sight of migrating birds which heralded land for Columbus and his mutinous crew, and concluding with the Lewis and Clark expedition's first joyful glimpse of the Pacific, just over three centuries later. The emphasis throughout is on what the explorers saw rather than on what they accomplished, though neither this nor the more reprehensible aspects of their characters and behavior has been ignored. Based on John Bakeless's "Eyes of Discovery," which is now out of print, this is a thoroughly adult book, in no way over the heads of teen-agers but one which their elders can read with profit. It has a map and a number of excellent illustrations.

**TIME OF WONDER** (8-12)

By Robert McCloskey, Viking, New York, 1957. 12 1/4 x 9 1/4 in., 63 pp. \$3.50.

While the text in places seems, like the title, slightly self-conscious, this book about an island summer off the coast

of Maine does have more than a little wonder in it. The sights, sounds, and sensations of showery, foggy, sunny, and, finally, hurricane weather have been recorded in rhythmic prose and in moist, spacious watercolors the best of which are wonderful indeed. It is not likely that every child will respond to the device of writing entirely in the second person ("Now take a breath—it's raining on you!"), but to those sensitive, poetically constituted ones who do, this book should give genuine delight.

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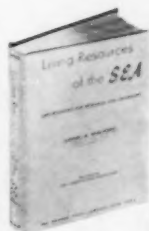
**A City Sparrow** (6-10)

Written and illustrated by Olive L. Earle, Morrow, New York, 1958. 8 x 6 3/4 in., 64 pp. \$2.50.

The author has watched city birds—pigeons, sparrows, starlings, harbor gulls—and she knows just how they behave. Here is her account of one of them, a house sparrow which began life in lower Manhattan's Battery Park, caught a ferryboat to Staten Island, and settled down in a garden over there. The whole thing, as in all of Miss Earle's stories is done with meticulous, even guarded, matter-of-factness, and its main appeal will no doubt be to city children familiar with the harbor scenes and the park-path squabbles Miss Earle herself knows so well.

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## WOODPECKERS — CARPENTERS FOR OTHER BIRDS — Continued from page 89

species) of chickadees, titmice, flycatchers, swallows, and bluebirds we find a total of at least 92 species and subspecies of birds that nest more or less regularly in woodpecker holes. To that list we could add at least a dozen others as "occasional."

In the areas of cold temperatures in our northern states, I have occasionally seen both hairy and downy woodpeckers at work on shelters for the winter. Excavating these cold weather "dens" starts with the setting in of heavy frosts or snow. The dugouts are similar to the cavities for nesting, but possibly not quite as deep. To the best of my knowledge they are always abandoned with the arrival of spring weather; and are never used by their builders for nesting. Of course, following their abandonment by the woodpeckers, they are available for the nesting of other birds. Near my woodland cabin in the Rockies I watched a hairy woodpecker dig its winter den; then, day after day, saw it enter the shelter for the night within a few minutes of the same time, late every afternoon. —THE END

## JOSEPH M. CADBURY

Member,  
Delaware Valley  
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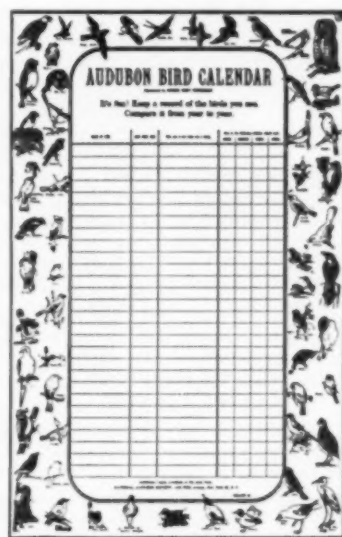
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## SPRING CLIMBS A MOUNTAIN

Continued from page 65

wild "Hic! three beers!" and "Pip Pip Pip" notes. From a perch high on a dead snag, he overlooks a landscape still moderately snow-covered in late May. The red fir belt is the snow reservoir of the Sierra—the region of deepest drifts, and the heaviest supplier of runoff water to the valley far below. To see spring at its fullest here, one must stay through June. Then the newly-arrived robins are snatching newly-hatched insects on freshly-thawed meadows and begin to build nests—as they do 2,000 feet lower in May. But a few signs indicate that Old Man Winter has cast his last spear. Some of the aspens quake again—tiny new leaves a-tremble in the chill wind. Others, in colder spots, boast much swollen buds. The few black oaks at this altitude stand draped with golden catkins, and creeks everywhere race torrentially with melted snow. Spring is coming shyly, hesitantly, at 7,500 feet when it is still winter half-a-mile straight up, and it is summer half-a-mile straight down.

—THE END

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## BIRD'S-EYE VIEW — Continued from page 57

spot in the *Marismas*, I tried a dead cow and although one Egyptian vulture came to investigate during my absence, I drew a blank with the griffons. Yet Guy Mountfort, setting up his blind near the completely stripped and sun-dried backbone of a fallow deer, within 20 minutes focused his lens on nine vultures of three species—griffon, Egyptian, and the rare black.

In Africa my luck has varied. A goat in western Uganda soon attracted a host of white-backed vultures, several hoodeds, a white-headed vulture, a marabou stork, two white-necked ravens, and a black kite. Another goat on an equally promising hill-slope in southern Kenya lured no takers up to the second day. I was surprised that not even a hyena had touched it during the night.

—THE END

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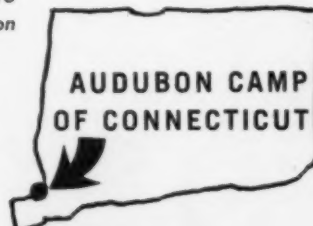
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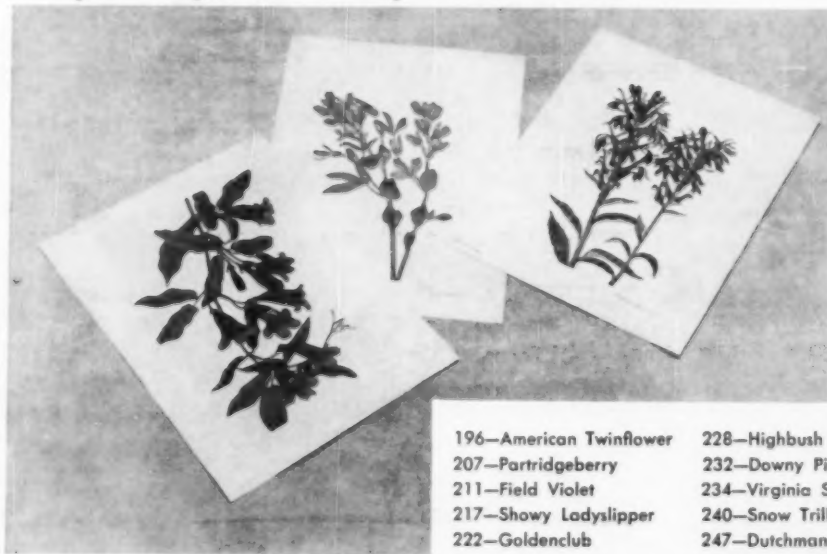
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